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Technical Safety Requirements (TSRs) for Waste Characterization, Reduction, and Repackaging Facility (WCRRF)

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HISTORY OF REVISIONS

Rev. No.	Description of Change	Affected Pages	Submittal to NNSA LASO Date	NNSA LASO Approval Date
0	Original Issue	All	4/23/07	4/25/07
0.1	Corrected page numbering in Section 3/4 Changed Minimum Staffing Requirement Added Drainage Trench as Safety Significant Design Feature Added Fire Resistant Barrier as Safety Significant Design Feature	All in Section 3/4 5-4 6-11 6-11, 6-12	7/09/07	7/20/07
0.2	Table of Contents Updated Changed Revision number and Date Revised definition of WASTE CONTAINER and added new definition for WASTE PACKAGE Revised definition of WARM STANDBY to allow for gamma spectroscopy analysis on and movement of closed TRU WASTE CONTAINER Added new LCO and SR 3/4.6 “Breaching Unvented, Sealed 30- to 5-gallon WASTE PACKAGES in WCG” Revised LCO and SR 3/4.4.2 “BUILDING TA-50-69 Combustible Loading” to clarify prohibition on flammable or combustible liquids is not applicable to contents in WASTE PACKAGES, and also to be fully consistent with new LCO 3/4.6 Added new SAC 5.10.1.6 “Use of Drum Lid Restraints when Breaching Unvented, Sealed 30-gallon WASTE PACKAGES in WCG” Added new SAC 5.10.1.7 “Use of Non-Sparking Tools / De-energization of WCG Electric Receptacles when Breaching Unvented, Sealed 30- to 5-Gallon WASTE PACKAGES within the WCG” Revised SAC 5.10.2.3.4, “TRU WASTE CONTAINER Inspection,” No. 4 language on headspace gas analysis being only applicable to 55-gallon drum which is to be bagged on to the WCG Repagination of section on SACs due to addition of SACs 5.10.1.6 and 5.10.1.7, and revision of SAC 5.10.2.3.4 Added new bases for LCO/SR 3/4.6	 All 1-7 1-9 3/4.6-1 3/4.4.1 and 3/4.4.2 5-15 5-17 5-20,21 5-15 – 5-22 Bases-3/4-51	11/19/07	11/30/07

Rev. No.	Description of Change	Affected Pages	Submittal to NNSA LASO Date	NNSA LASO Approval Date
	Revised bases for LCO/SR 3/4.4	Bases-3/4-43,44,47		
0.3	Revised SB-DO and FOD signatures Revised inspection criteria for headspace concentration of hydrogen. New inspection requires concentration of hydrogen is <4%. Technical basis provided.	Signature page 5-20,21-22	10/20/08	10/21/08 (Temporary approval – See correspondence SBT:14JT-001)
1.0	As part of annual update, revised date. Revised SB-DO and FOD signatures. On Table 5.2.3.1 *Minimum Operating Shift Complement*, revised requirements of *Shift Operations Manager* and added requirement for a *Shift Operations Supervisor* Revised inspection criteria for headspace concentration of hydrogen. New inspection requires that concentration of hydrogen is < 4%. Technical basis provided. (Note: revised from Revision 0.2, because Revision 0.3 was a temporary approval.)	All Signature page 5-4 5-20,21,22	4/25/08 2/24/09	3/6/09
1.1	Page changes pertaining to FSS freeze protection (Addendum 1) and HEPA filter efficiency (Addendum 2) Added TE/TI to acronym list. Added Condition 4 to LCO 3.2 for Fire Suppression System for freeze protection. Added Surveillances 4.2.8 and 4.2.9 for Fire Suppression System freeze protection surveillance. Changed LCO 3.3.2 Condition 2a for required in-place HEPA filter efficiency. Changed SR .3.2.1, required HEPA filter efficiency. Added Basis for LCO 3.2 Condition Statement #4. Added Bases for SR 4.2.8 and SR 4.2.9.	 Acronyms 3 /4.2-1 3 /4.2-2 3 /4.3-5 3 /4.3-7 Bases 3 /4-21 Bases 3 /4-25 and 3 /4-26	1/29/10 FSS freeze protection 3/23/10 HEPA	3/16/10 FSS freeze protection 5/3/10 HEPA

Rev. No.	Description of Change	Affected Pages	Submittal to NNSA LASO Date	NNSA LASO Approval Date
	Added reference to CALC-10-TA5000069-003	Bases 3 /4-27		
	Changed basis for LCO 3.3.2 to reflect change in required HEPA efficiency and testing method.	Bases 3 /4-28		
	Changed basis for SR 4.3.1.1 to reflect new testing method.	Bases 3 /4-34		
	Deleted references to ASTM-F-1471 93	Bases 3 /4-36		
	Changed description of WCG Glovebox Confinement to reflect new HEPA filter testing method.	Bases 3 /4-37		
	Changed LCO 3.3.2 Condition statement #2a to reflect new HEPA filter efficiency requirements	Bases 3 /4-38		
	Changed Basis for SR 4.3.2.1 to reflect new HEPA filter testing method. .	Bases 3/ 4-41		
	Deleted reference to ASTMI-1471 93	Bases 3 /4-43.		
1.2	Page changes to allow installation of Fire Suppression Sprinkler in the Waste Characterization Glovebox and Relocation of the Building 50-82 Transformer		9/2/2010	10/5/2010
	Added “and WCG” to condition statement #1 of LCO 3.2.	3 /4.2-1		
	Added Surveillance 4.2.10 to verify that the WCG sprinkler head is in the open position weekly.	3 /4.2-2		
	Deleted Section 5.10.1.2 WCG Fire Controls	5-14 and 5-15		
	Deleted Section 6.3.7 Drainage Trench	6-12		
	Deleted Section 6.3.8 Fire Resistant Barrier	6-12, 6-13 and 6-14		
	Added statement on possible loss of confinement/containment with activation of the SCG /sprinkler head.	Bases 3 /4-20		
	Added “and WCG sprinkler head” to basis for LCO3.2 Condition Statement #1	Bases 3 /4-21		
	Added Bases for SR 4.2.10	Bases 3 /4-25		

Rev. No.	Description of Change	Affected Pages	Submittal to NNSA LASO Date	NNSA LASO Approval Date
1.3	Modified LCO 3.4 condition statements and SR to clarify the combustible control limits and exclusions. Updated Bases for LCO 3.4 condition statements and SR to clarify combustible control limits and exclusions, and add references.	3 /4.4-1 3 4.4-2 Bases 3 /4-42 through 3 /4-49	1/12/2011	1/14/2011
2.0	Annual update to roll-up previously approved page changes, update select definitions, and address adjustments to the controls as credited in the Hazard and Accident Analyses in response to comments from the DOE review of the annual update of the WCRRF BIO. Changed Revision Number and Date. Updated Table of Contents Updated definitions of Operable and Violation of TSR Replaced TSR Violation information in 5.3.3, 5.3.4, and 5.3.5 Removed Fire Watch definition and deleted Fire Watch column from minimum staffing requirements in Table 5.2.3-1 Transferred the outside combustible control from an element of the Fire Protection Program, to existing LCO 3.4 and change applicability from TRU waste containers to Transportainers.	All viii - x 1-5, 1-7 5-5, 5-6 1-4, 5-4	11/3/2010 and 1/20/2011 for incorporation of Rev 1.3 page changes	5/27/2011
2.1	Revised LCO 3 / 4.1, WCRRF Inventory, to increase Building TA-50-69 MAR limit to 800 PE-Ci (as assumed in the WCRRF BIO Hazard Analysis) to allow processing of higher activity containers from Area G. Updated Bases for LCO 3 /4.1, WCRRF Inventory Expanded LCO 3 /4.4, Combustible Loading, to address COA #3 and control combustible loading *inside* transportainers in addition to 10 ft around the outside (as required by COA #3 in SER WCRRF.01, Revision 1). Updated exhaust flow ratio information in the Basis for Design Feature 6.3.2, Building Confinement Ventilation System. Removed transportainer as a design feature because it	3 /4.1-1 3 /4.1-2 Bases 3 /4, -16, thru -19 3 /4.4-1 3 /4.4-2 Bases 3 /4-42, -43, -46, -48 6-8 6-9, 6-10	June 2011	Approved November, 2011 by SO:26BJ-385770

Rev. No.	Description of Change	Affected Pages	Submittal to NNSA LASO Date	NNSA LASO Approval Date
	only provides defense-in-depth and was not credited with any accident mitigation (i.e., reduction in damage ratio or other source term parameter). Credited SACs were retained to require placement and use of transportainers for staging of TRU waste containers, and for limitation of combustibles in or near the transportainers.			
	Changed the Lightning Protection System (LPS) from a design feature, to a defense-in-depth system (maintained according to NFPA 780 requirements through the Maintenance Program) because the LPS cannot reduce the lightning-induce fire frequency enough for a credited SSC.	5-11, 6-10		
	Clarified the 40ºF containment ventilation temperature interlock function discussed in the FSS LCO Basis. The interlock secures the building supply air, but does not start the attic heaters. Also, clarified the fire water entrainment text.	Bases 3 /4-20, -21, -24		
	Clarified the Electrical Distribution System's function to support normal ventilation fan operation, but not the safety function of confinement in the Basis for LCO 3 /4.3.1 and 3 /4.3.2.	Bases 3/4-28, 36		
	Modified the Bases for LCO 3 /4.3.1 and 3 /4.3.2 (in addition to expanding system vulnerability discussion in BIO Chapter 4) to address Confinement Ventilation System assessment findings (as required by COA #4 in SER WCRRF.01, Revision 1). Added new SAC 5.10.2.5 to prohibit storage, staging, or processing of inventory within the GBE (per LASO direction in SER-WCRRF-ESS-11-002)	Bases 3/4-28, -29, -34, -35, -36, -37, -41		
	Editorial correction of several SAC number references where 5.10.1.7 was listed instead of the intended 5.10.1.6 (for non-sparking tools).	5-23		
	Revised date and revision number in page headers.	ALL		
	Added SAC 5.10.1.7 for Extra Fire Controls for High-MAR Processing in WCG	5-18		
2.2	Cover Page Revision Log List of Effective Pages	v, vi, vii viii	February 2016	Not approved - resubmitted with changes as R2.3

Rev. No.	Description of Change	Affected Pages	Submittal to NNSA LASO Date	NNSA LASO Approval Date
	Page Change to Rev. 2.2.			
	Clarified applicability of the Vehicle Access System Specific Administrative Control (SAC) (Section 5.10.1.4)	5-15		
	Added applicability statements to the following design features:			
	Section 6.1 Design Features	6-3		
	Section 6.2.1 Vehicle Barriers	6-4		
	Section 6.3.1 Building TA-50-69 Structural Integrity	6-7		
	Section 6.3.2 WCRRF BUILDING TA-50-69 Confinement Ventilation System	6-8		
	Section 6.3.3 Waste Characterization Glovebox	6-9		
	Revised date and revision number in page headers; added document number to footers.	ALL		
2.3	Added to WCRRF Definition	1-7	March 2016	
	Corrected Title of SAC 5.10.1.7	5-18		
	Clarified ISIs for DFs	6-3		

List of Effective Pages

Page	Rev		Page	Rev		Page	Rev		Page	Rev
ALL	0		ALL	0.3		All	2.2			
5-4, 6-11, 6-12	0.1		Signature page	0.3		All	2.3			
ALL	0.2		5-20, 5-21, 5-22	0.3						
1-7, 1-9	0.2		All	1.0						
3/4.6-1	0.2		Signature page	1.0						
3/4.4-1 3/4.4-2	0.2		5-4, 5-20, 5-21, 5-22	1.0						
5-15 to 5-22	0.2		Acronyms 3/4.2-1 3 4.2-2 3/4.3-53 /4.3-7 Bases 3/4-21 Bases 3/4-25 Bases 3/4-26 Bases 3/4-27 Bases 3/4-28 Bases 3/4-34 Bases 3/4-36 Bases 3/4-37 Bases 3/4-38 Bases 3/4-41 Bases 3/4-43	1.1						
Bases-3/4-43	0.2		3 /4.2-1 3 /4.2-2 5-14 and 5-15 6-12 6-12, 6-13 and 6-14 Bases 3 /4-20 Bases 3 /4-21 Bases 3 /4-25	1.2						
Bases-3/4-44	0.2		3/ 4.4-1 3/ 4.4-2 Bases 3/4-42 through 3 /4-49	1.3						
Bases-3/4-47	0.2		ALL	2.0						
Bases-3/4-51	0.2		ALL	2.1						

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ACRONYMS

AC	Administrative Control
ALARA	As Low As Reasonably Achievable
CAS	Central Alarm Station
CFR	Code of Federal Regulations
CSA	Container Storage Area
CSE	Criticality Safety Evaluation
DF	Design Feature
DBE	Design Basis Event
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DSA	Documented Safety Analysis
EBA	Evaluation Basis Accident
EDS	Electrical Distribution System
EG	Evaluation Guideline
FSS	Fire Suppression System
GB	Glovebox
GBE	Glovebox Enclosure
gpm	gallons per minute
HC	Hazard Category
ISI	In-Service Inspection
LANL or the Laboratory	Los Alamos National Laboratory
LCO	Limiting Condition for Operation
LCS	Limiting Control Setting
LFL	Lower Flammability Limit
lbs	pounds
LPS	Lightning Protection System
MAR	material-at-risk
MEOI	Maximally exposed offsite individual
NFPA	National Fire Protection Association
OIT	Operator Interface Terminal
PE-Ci	Plutonium-Equivalent Curies
PC	Performance Category
psig	pounds per square inch gauge

QA	Quality Assurance
SAC	Specific Administrative Control
SC	Safety Class
SCADA/ESS	Surveillance, Control and Data Acquisition/Equipment Surveillance System
SL	Safety Limit
SR	Surveillance Requirement
SS	Safety Significant
SSC	Structure, System, and Component
TA	Technical Area
TE/TI	Temperature Element/Temperature Indicator
TRU	Transuranic
TSR	Technical Safety Requirement
UPS	Uninterruptible Power Supply
USQ	Unreviewed Safety Question
VOCs	Volatile Organic Compounds
wc	water (generally in inches) column
WCRRF	Waste Characterization, Reduction, and Repackaging Facility
WCG	Waste Characterization Glovebox
wg	water (generally in inches) gauge
WIPP	Waste Isolation Pilot Plant

PREFACE

This document establishes Technical Safety Requirements (TSRs) for the Waste Characterization, Reduction, and Repackaging Facility (WCRRF) in Technical Area (TA)-50 at the Los Alamos National Laboratory (LANL or the Laboratory). WCRRF operations are carried out in BUILDING TA-50-69 and in the outside transportainers as well as other outdoor areas. The facility is used primarily for waste processing and repackaging activities.

The TSRs contained in this document constitute an agreement between Los Alamos National Security LLC (LANS) and the U.S. Department of Energy (DOE) for operating the WCRRF. These TSRs are derived from safety requirements specified in the WCRRF BASIS FOR INTERIM OPERATIONS (BIO), referred to in this document as the Documented Safety Analysis (DSA). These requirements address the minimum performance levels necessary to maintain facility safety at the WCRRF by eliminating, confining, and mitigating hazard consequences independent of process efficiency or product quality. These TSRs define the LIMITING CONDITIONS FOR OPERATION (LCOs), ACTIONS, and SURVEILLANCE REQUIREMENTS (SRs), together with the bases thereof, safety boundaries, and management or ADMINISTRATIVE CONTROLS (ACs) necessary to ensure safe operation of the WCRRF. These requirements protect the health and safety of the public and minimize the potential risk to workers from uncontrolled release of radioactive or other hazardous materials.

These TSRs apply to waste operations at the WCRRF. The DSA establishes the WCRRF as a Hazard Category (HC)-2 nuclear facility in accordance with DOE-STD-1027-92.

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1.0 USE AND APPLICATION

1 USE AND APPLICATION

1.0 USE AND APPLICATION

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1.0 USE AND APPLICATION

1.1 DEFINITIONS

NOTE: The terms defined in this section appear in capitalized type and are applicable throughout this TECHNICAL SAFETY REQUIREMENT (TSR) document. The use of these terms without capitalization means the common dictionary definition is used. Brackets {} identify source documents.

Term	Definition
ACTION	The mandatory response that is required to be performed when a specified LIMITING CONDITION FOR OPERATION is not met. These steps provide interim remedial ACTIONS or compensatory protection for the safety concern(s) for which the limit was established.
ADMINISTRATIVE CONTROLS (ACs)	The provisions relating to organization and management, procedures, recordkeeping, assessment, and reporting necessary to ensure safe operation of the Waste Characterization, Reduction, and Repackaging Facility (WCRRF). {10 CFR 830}
BASIS FOR INTERIM OPERATION (BIO)	An acceptable form of DOCUMENTED SAFETY ANALYSIS in accordance with Table 2 of Appendix A, General Statement of Safety Policy, to Title 10 of the *Code of Federal Regulations* Part 830, Nuclear Safety Management, Subpart B, "Safety Basis Requirements" {DOE-STD-3011-2002}. It is applicable to the following hazard category 1, 2, or 3 nuclear facilities and activities: a nuclear facility with a limited operational life, the deactivation of a nuclear facility, and the transition surveillance and maintenance of a nuclear facility.
BUILDING TA-50-69	BUILDING TA-50-69 consists of a vehicle airlock, an unloading area, a high-bay area, a mezzanine, and a change room. The unloading and high bay areas are known as the "main process area," and together they provide the necessary space to conduct waste characterization and repackaging operations.
CHANNEL CALIBRATION	The adjustment (as necessary) of the channel output such that it responds within the necessary range and accuracy to known values of the parameters that the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel, including the sensor, alarm, trip functions, and shall include the CHANNEL FUNCTIONAL TEST. The CHANNEL CALIBRATION may be performed by any series of sequential, overlapping, or total channel steps such that the entire channel is calibrated.
CHANNEL FUNCTIONAL TEST	The injection of simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY, including required alarms, interlocks, trip functions, and channel failure trips.

1.0 USE AND APPLICATION

1.1 DEFINITIONS

CONFINEMENT INTEGRITY	The state of the BUILDING TA-50-69 structure that is credited in the DSA as providing support to the BUILDING TA-50-69 ventilation system. The CONFINEMENT INTEGRITY is met when: 1. The roof access port above the mezzanine is closed. 2. At least one vehicle door closed.
DEGRADED DRUM	A drum that has visible rust, physical deformation, or other deficiencies that have not resulted in breach of the drum containment or reduction in structural capability. DEGRADED drums may be wrapped with plastic as a conservative measure.
DOCUMENTED SAFETY ANALYSIS	A documented analysis of the extent to which a nuclear facility can be operated safely with respect to the worker, the public, and the environment, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety. {10 CFR 830}
ENSURE	Equipment is allowed to be manipulated to achieve the desired goal.
EQUIVALENT COMBUSTIBLE WASTE	That quantity of waste which would provide the same dose to the maximally exposed offsite individual (MEOI) for the bounding accident as one plutonium equivalent curie (PE-Ci) of waste contained in a combustible matrix.
FIRE PATROL	A periodic walk-through (once per hour) of the WCRRF for the purpose of making fire safety observations that include ignition sources, changes in combustible loading, unauthorized activities, and situations that could increase the potential for a fire or consequences of a fire. FIRE PATROL personnel must be trained to use fire extinguishers and may manually fight fires in accordance with Laboratory and facility policies and procedures. The FIRE PATROL must remain on site at the WCRRF for the remainder of the condition.
FREQUENCY	How often a specific surveillance must be performed.
GLOVEBOX OPERATIONS	Operations in the Waste Characterization Glovebox (WCG) involving radioactive waste material, including lifting and lowering WASTE CONTAINERS containing such material. Routine decontamination of glovebox surfaces and glovebox maintenance are excluded from this definition.
IMMEDIATE/ IMMEDIATELY	Term used as completion time for ACTION statements when a step is to be initiated as soon as possibly achievable without creating a less stable condition, and continuously and aggressively pursued until complete.
INOPERABLE/ INOPERABILITY	Not OPERABLE

1.0 USE AND APPLICATION

1.1 DEFINITIONS

IN-SERVICE INSPECTION (ISI)	Inspections performed on Design Features in accordance with the TECHNICAL SAFETY REQUIREMENTS.
INVENTORY	INVENTORY is considered to be Material-at-Risk (MAR) that is transuranic (TRU) waste in either WASTE CONTAINERS within WCRRF or in process in BUILDING TA-50-69. INVENTORY does not include residual RADIOACTIVE MATERIAL contamination in the ventilation system, WCG, GBE, or BUILDING TA-50-69.
LIMITING CONDITION FOR OPERATION (LCO)	The limits that represent the lowest functional capability or performance level of safety structures, systems, and components (SSCs) required for safe operations. {10 CFR 830}
LIMITING CONTROL SETTING (LCS)	Settings on safety systems that control process variables to prevent exceeding a safety limit. {10 CFR 830}
LOSS OF INTEGRITY	A drum has a LOSS OF INTEGRITY when it presents a visible breach or other indications such as external contamination that demonstrates a loss of confinement or physical deformation that compromise structural capabilities. Drums with a LOSS OF INTEGRITY may be wrapped with plastic as a conservative measure.
MODE	Any WCRRF state or condition described in Section 1.2 of this document.
OPERABLE/ OPERABILITY	A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s); and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication, or other auxiliary equipment that is required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
RADIOACTIVE MATERIAL	Material that emits radiation. Any material, equipment, or system component determined to be contaminated or suspected of being contaminated. RADIOACTIVE MATERIAL also includes activated material, sealed and unsealed sources, and waste material. RADIOACTIVE MATERIAL is expressed in terms of plutonium-equivalent curies (PE-Ci), generally recognized as the standard unit for expressing radioactivity for TRU waste.

1.0 USE AND APPLICATION

1.1 DEFINITIONS

SAFE CONFIGURATION	The minimization of risk in on-going processes by evaluating actual facility conditions and placing the INVENTORY in the most stable condition. The first priority is to have TRU waste in closed, authorized WASTE CONTAINERS. Facility procedures provide additional guidance to define SAFE CONFIGURATION for specific LCOs. However, if this action adds to the hazard, other alternatives to reach the most stable condition will require decision by the facility management. No additional INVENTORY may be introduced into BUILDING TA-50-69.
SPECIFIC ADMINISTRATIVE CONTROL (SAC)	An AC that provides a specific preventive or mitigative function for accident scenarios identified in the DSA where the safety function has importance similar to, or the same as, the safety function of a safety SSC (e.g., discrete operator actions, combustible loading program limits, hazardous material limits protecting hazard analyses or facility categorization) {DOE-STD-1186}.
STATIONARY FIRE WATCH	A person stationed at a specific location with no other assigned duties for the purpose of making fire safety observations, notifying building occupants and the fire department of an emergency, preventing a fire from occurring, and/or extinguishing small fires as trained.
SURVEILLANCE REQUIREMENT (SR)	Requirements relating to test, calibration, or inspection to ensure that the necessary OPERABILITY and quality of safety structures, systems, and components, and their support systems required for safe operations are maintained, and that WCRRF operation is within SAFETY LIMITS, and that LIMITING CONTROL SETTINGS, and LIMITING CONDITIONS FOR OPERATIONS are met. {10 CFR 830}
TECHNICAL SAFETY REQUIREMENT (TSR)	The limits, controls, and related actions that establish the specific parameters and requisite ACTION for the safe operation of a nuclear facility and include, as appropriate for the work and the hazards identified in the DOCUMENTED SAFETY ANALYSIS for the facility: SAFETY LIMITS, LIMITING CONTROL SETTING, LIMITING CONDITION FOR OPERATION, SURVEILLANCE REQUIREMENTS, ADMINISTRATIVE CONTROLS and management, use and applications provisions, and design features, as well as a bases appendix. {10 CFR 830}

1.0 USE AND APPLICATION

1.1 DEFINITIONS

VERIFY/ VERIFICATION/ VERIFYING	To confirm and substantiate that an activity or condition has been implemented in conformance with the specified requirements. Manipulation of equipment or instrumentation to conform to the specified requirements is not permitted. Formal methods other than direct observation may be used. VERIFICATION of actual equipment parameters may be conducted by direct observation or by using measurement equipment as applicable (e.g., a review of records to VERIFY SRs are current or passive measurement).
VIOLATION (TSRs)	See Administrative Control 5.3.3.
WASTE CONTAINER	Any one of a number of metal container types, specifically 55-gallons or larger), containing INVENTORY, as listed in the Design Features, Section 6.2.2, that can be present at the WCRRF.
WASTE PACKAGE	Any configuration of INVENTORY inside of a 55-gallon drum WASTE CONTAINER.
WCRRF	BUILDING TA-50-69 and other nearby operations in the WCRRF yard, including transportainers and ancillary structures associated with, and outside of, BUILDING TA-50-69 operations.

1.0 USE AND APPLICATION

1.2 MODES

To aid in compliance with the WCRRF LIMITING CONDITION(S) FOR OPERATION (LCOs), operational MODES are established to provide a safe, structured approach to BUILDING TA-50-69 Facility operations. MODES reflect the relative hazards associated with different facility or process configurations; categorize the requirements placed on the facility as a convenience for operator control; and aid the operations staff in determining when the LCO is applicable. Also, MODES provide a convenient way to ensure availability of all pertinent safety functions during the current area applicability/system configuration because not all safety functions are required in each MODE. If equipment performs a safety function, but the safety function is not required in certain MODES, it would be inefficient to require the equipment to be OPERABLE when it is not needed.

The three MODES, as defined in Table 1.2-1, for all of the area applicability(s) in the WCRRF are COLD STANDBY, WARM STANDBY, and OPERATION. The hierarchy of MODES, from the lowest to the highest in relation to hazards, is listed in sequential order in the sentence above. MODE designations and changes are determined by the INVENTORY within WCRRF in accordance with the MODE definitions. There are certain requirements and characteristics that will be present during each MODE.

The MODE definition addresses the actual performance or the capability of the WCRRF area applicability to conduct its intended function. This definition allows equipment or an operation to be started or stopped, as needed, and still remain in one of the three operational MODES.

1.0 USE AND APPLICATION

1.2 MODES (cont.)

Table 1.2-1

MODE	DESCRIPTION
COLD STANDBY	In COLD STANDBY MODE, all INVENTORY has been removed from the WCRRF or BUILDING TA-50-69, except for surface contamination and sources used for equipment calibration, and facility generated non-TRU waste. Activities allowed in this MODE are decontamination, maintenance, facility modifications, and calibration of equipment.
WARM STANDBY	In WARM STANDBY MODE, all INVENTORY shall be in a SAFE CONFIGURATION, except for surface contamination and sources used for equipment calibration, and facility generated radioactive waste. Only the following activities are allowed in WCRRF or BUILDING TA-50-69 during WARM STANDBY MODE: Staging the retained INVENTORY in closed WASTE CONTAINERS. Handling, transfer, shipping or associated activities (for example, gamma spectroscopy analysis) involving closed WASTE CONTAINERS. Other activities allowed in this MODE are decontamination, maintenance, calibration, of equipment, and associated activities necessary to maintain the authorization basis (e.g., SURVEILLANCE REQUIREMENTS, permit driven inspections).
OPERATION	During OPERATION, waste processing and repackaging activities are allowed within BUILDING TA-50-69. All WASTE CONTAINER transfer, handling, staging, shipping, receiving, and activities to support operations are also allowed within WCRRF.

1.0 USE AND APPLICATION

1.3 FREQUENCY NOTATION

PURPOSE The purpose of this section is to explain the proper application and use of frequency notation for SURVEILLANCE REQUIREMENTS (SRs).

BACKGROUND Each SR has a specified frequency in which the surveillance shall be performed. The frequency notation used in this TSR document is in agreement with DOE G 423.1-1.

FREQUENCY NOTATION The frequency notations used in this TSR shall be followed when included in the TSR.

Table 1.3-1. SURVEILLANCE REQUIREMENT FREQUENCY

Notation	**FREQUENCY**	**FREQUENCY + 25%** (see Note 1)
DAILY	24 hours	30 hours
WEEKLY	7 days	8 days
MONTHLY	31 days	38 days
QUARTERLY	91 days	113 days
ANNUALLY	365 days	456 days

NOTE 1: It is expected that all SRs will be performed within their FREQUENCY(IES). This column represents the 25% extension allowed by SR 4.0.2. The extension is not applicable to periodic verifications of compliance with SACs and ISIs.

1.0 USE AND APPLICATION

1.3. FREQUENCY NOTATION (cont.)

APPLICATION The following example demonstrates the use of FREQUENCY in this TSR.

Example SR 1.3-1

SURVEILLANCE REQUIREMENT	FREQUENCY
Perform a channel check	12 hours

Example SR 1.3-1 contains the most common SR encountered throughout the TSRs. It specifies an interval (12 hours) during which the associated SRs shall be performed at least one time. Performance of the surveillance initiates the subsequent interval. Although the FREQUENCY is stated as 12 hours, an extension of the time interval to 1.25 times the stated FREQUENCY is allowed by SR 4.0.2 for operational flexibility. The measurement of this interval continues at all times, even when the SR is not required by SR 4.0.1 (such as when equipment is INOPERABLE, a variable is outside specified limits, or the facility is outside the applicability of the LCO). In cases where the interval specified by SR 4.0.2 is exceeded while in a MODE or other specified condition for which the performance of the SR is required, SR 4.0.3 becomes applicable. In cases where the interval as specified by SR 4.0.2 is exceeded while not in a MODE or other specified condition which performance of the SR is required, the SR shall be performed before entry into the MODE or other specified condition. Failure to do so would result in a violation of SR 4.0.4 and an invalid MODE change as specified by LCO 3.0.4.

Sometimes special conditions dictate when a surveillance is to be met. These conditions apply to the surveillance or to the FREQUENCY, or both. They are the “otherwise stated” conditions allowed by SR 4.0.1. Furthermore, these conditions may be stated as clarifying notes or as part of the SR itself. The following examples discuss these special conditions.

1.0 USE AND APPLICATION

1.4 LOGICAL CONNECTORS

PURPOSE	The purpose of this section is to explain the use and application of logical connectors.
BACKGROUND	Logical connectors are used in TSRs to discriminate between (and yet connect) discrete condition(s), ACTION(s), completion time(s), SRs, and FREQUENCIES. The logical connectors include "**AND**" and **"OR**." The physical arrangement of this connector on a page constitutes a specific meaning in accordance with the convention established in DOE G 423.1-1.
USE OF LOGICAL CONNECTORS	Several levels of logic may be used to state ACTION(s). These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each ACTION. The first level of logic is identified by the first digit of the number assigned to an ACTION and the placement of the logical connector in the first level of nesting (for example, left-justified with the number of the ACTION). The successive levels of logic are identified by additional digits of the ACTION number and by successive indenting of the logical connectors. When logical connectors are used to state a condition, usually only the first level of logic is used and the logical connector is left-justified with the condition statement. In a few cases, successive levels of logic are used. This lower level is identified solely by indenting the logical connector because subparts of a condition statement are not numbered separately. When logical connectors are used to state a completion time, SRs, or FREQUENCY, only the first level of logic is used; and the logical connector is left justified with the statement of the completion time, SR, or FREQUENCY.
DEFINITION OF LOGIC TERMS	The defined terms of this section appear in capitalized type, bolded, and underlined though out this TSR.

Term	Definition
AND	Used to connect two or more sets of criteria that must both (all) be satisfied for a given logical decision.
OR	Used to denote alternate combinations or conditions, meaning either one or the other criterion will satisfy a given logical decision.

1.0 USE AND APPLICATION

1.4 LOGICAL CONNECTORS (cont.)

APPLICATION The following example demonstrates the application of logical connectors used in this TSR.

Example 1.4-1

CONDITION	ACTION	COMPLETION TIME
Situation that does not meet LCO statement	A.1 Terminate A	IMMEDIATELY
	AND	
	A.2 Perform BC	1 hour
	AND	
	A.3.1 Restore V	1 hour
	OR	
	A.3.2.1 Initiate S	1 hour
	AND	
	A.3.2.2 Place the facility in MODE S	4 hours

The logic shown in the above tabular presentation allows only two approved outcomes upon occurrence of the specified situation that does not meet the LCO:

1.A.1 (Terminate A), and A.2 (Perform BC), and A.3.1 (Restore V), **or**

2.A.1 (Terminate A), and A.2 (Perform BC), and A.3.2.1 (Initiate S), and A.3.2.2 (Place the facility in MODE S).

1.0 USE AND APPLICATION

1.5 COMPLETION TIMES

PURPOSE	The purpose of this section is to establish the completion time convention and provide guidance for its use.
BACKGROUND	LCOs specify the minimum requirements for ensuring safe operation of the WCRRF. The ACTION(s) associated with a LCO state the conditions required to meet the LCO. Specified with each stated condition are required ACTION(s) and completion time(s).
COMPLETION TIME	The completion time is the amount of time allowed to complete an ACTION. It is referenced to the time a situation (e.g., INOPERABLE equipment or variable not within limits) is declared that requires entering an ACTION condition, providing the facility is in a MODE or specified condition stated in the Applicability portion of the LCO. ACTIONS shall be completed before the specified completion time expires. An ACTION condition remains in effect until the condition no longer exists or the facility is not within the LCO Applicability. If situations are declared that require entry into more than one condition within a single LCO (multiple conditions), the ACTIONS for each condition shall be performed within the associated completion time. When in multiple conditions, separate completion time(s) are tracked for each condition, starting from the time of declaration of the situation that required entry into the condition. Once a condition has been entered, subsequent trains, subsystems, components, or variables expressed in the condition declared to be INOPERABLE or not within limits shall <u>not</u> result in separate entry into the condition. The ACTIONS of the condition continue to apply to each additional failure, with completion time(s) based on initial entry into the condition. Entry into an LCO ACTION and LCO ACTION completion time(s) shall be documented. If compliance with TSR requirements is not formally documented, then compliance with the TSRs cannot be demonstrated and a violation exists.

1.0 USE AND APPLICATION

1.5 COMPLETION TIMES (continued)

APPLICATION	The following examples, 1.5-1 through 1.5-5, illustrate the use of completion time(s) with different types of conditions and changing conditions.

Example 1.5-1

CONDITION	ACTION	COMPLETION TIME
B. ACTION and associated completion time not met.	B.1 Be in MODE 3. **AND** B.2 Be in MODE 4.	1 hours 3 days

Condition B has two ACTIONS. Each ACTION has its own separate completion time. Each completion time is referenced to the time that condition B is entered.

The ACTIONS of condition B are to be in MODE 3 in 1 hour **AND** in MODE 4 in 3 days. A total of 1 hour is allowed to reach MODE 3, and a total of 3 days (not 3 days plus 1 hour) is allowed to reach MODE 4 from the time that condition B was entered. If MODE 3 is reached in 30 minutes, the time allowed to reach MODE 4 is the next 71 hours and 30 minutes, because the total time allowed to reach MODE 4 is 3 days.

If condition B is entered while MODE 3, the time allowed to reach MODE 4 is the next 3 days.

1.0 USE AND APPLICATION

1.5 COMPLETION TIMES (cont.)

Example 1.5-2

CONDITION	ACTION	COMPLETION TIME
A. One pump is INOPERABLE.	A.1 Restore pump to OPERABLE status.	7 days
B. ACTION and associated completion time not met.	B.1 Be in MODE 3. **AND** B.2 Be in MODE 4.	1 hours 3 days

When a pump is declared INOPERABLE, condition A is entered. If the pump is not restored to OPERABLE status within 7 days, condition B is entered and the completion time clocks for ACTIONS B.1 and B.2 start. If the INOPERABLE pump is restored to OPERABLE status after condition B is entered, the ACTIONS of condition B may be terminated.

When a second pump is declared INOPERABLE while the first pump is still INOPERABLE, condition A is not re-entered for the second pump. LCO 3.0.3 is entered, because the ACTIONS do not include a condition for more than one INOPERABLE pump. The completion time clock for condition A does not stop after LCO 3.0.3 is entered, but continues to be tracked from the time condition A was initially entered.

While in LCO 3.0.3, if one of the INOPERABLE pumps is restored to OPERABLE status and the completion time for condition A has not expired, LCO 3.0.3 may be exited and operation continued in accordance with condition A.

While in LCO 3.0.3, if one of the INOPERABLE pumps is restored to OPERABLE status and the completion time for condition A has expired, LCO 3.0.3 may be exited and operation continued as specified in condition B. The completion time for condition B is tracked from the time the condition A completion time expired.

After one of the pumps is restored to OPERABLE status, the condition A completion time is not reset, but continues from the time the first pump was declared INOPERABLE. This completion time may be extended if the restored pump was the first INOPERABLE pump. A 24-hour extension to the 7 days is allowed, provided this does not result in the second pump being INOPERABLE for >7 days (which could occur only if the second pump became INOPERABLE <24 hours after the first pump).

1.0 USE AND APPLICATION

1.5 COMPLETION TIMES (cont.)

Example 1.5-3

CONDITION	ACTION	COMPLETION TIME
A. One or more valves INOPERABLE.	A.1 Restore valves to OPERABLE status.	4 hours
B. ACTION and associated completion time not met.	B.1 Be in MODE 3. **AND** B.2 Be in MODE 4.	1 hour 3 days

A single completion time is used for any number of valves INOPERABLE at the same time. The completion time associated with condition A is based on the initial entry into condition A and is not tracked on a per-valve basis. Subsequent valves declared INOPERABLE, while condition A is still in effect, do not require that unique completion time (s) be tracked.

After one of the valves is restored to OPERABLE status, the condition A completion time is not reset, but continues from the time the first valve was declared INOPERABLE. The completion time may be extended if the restored valve was the first INOPERABLE valve. The condition A completion time may be extended for up to 4 hours, provided this does not result in any subsequent valve being INOPERABLE for >4 hours.

If the completion time of 4 hours (including any extensions) expires while one or more valves are still INOPERABLE, condition B is entered.

1.0 USE AND APPLICATION

1.5 COMPLETION TIMES (cont.)

Example 1.5-4

----------**NOTE**----------
Separate condition entry is allowed for each INOPERABLE valve.

CONDITION	ACTION	COMPLETION TIME
A. One or more valves INOPERABLE.	A.1 Restore valves to OPERABLE status.	4 hours
B. ACTION and associated completion time not met.	B.1 Be in MODE 3. **AND** B.2 Be in MODE 4.	12 hours 36 hours

An exception note is included above in the ACTIONS Table to modify how the completion time is tracked. If this method is only applicable to condition A, the note may appear in the condition column.

In this example, the note allows condition A to be entered separately for each INOPERABLE valve and completion time(s) tracked on a per-valve basis. When a valve is declared INOPERABLE, condition A is entered and its completion time starts. If subsequent valves are declared INOPERABLE, condition A is entered for each valve and separate completion time(s) start and are tracked for each valve.

If the completion time associated with a valve in condition A expires, condition B is entered for that valve. If the completion time(s) associated with subsequent valves in condition A expire, condition B is entered separately for each valve and separate completion time(s) start and are tracked for each valve. If a valve that caused entry into condition B is restored to OPERABLE status, condition B is exited for that valve.

Because this example contains a note allowing multiple entry and tracking separate completion time(s), completion time extensions do not apply.

1.0 USE AND APPLICATION

1.5 COMPLETION TIMES (cont.)

Example 1.5-5

CONDITION	ACTION	COMPLETION TIME
A. One channel is INOPERABLE.	A.1 Perform SR 4.x.x.x. **OR** A.2 Reduce temperature to ≤50% of the allowed rated temperature.	Once per 8 hours 8 hours
B. ACTION and associated completion time not met.	B.1 Be in MODE 3.	1 hour

Entry into condition A offers a choice between ACTION A.1 or A.2. ACTION A.1 has a "once per" type completion time that qualifies for the 25% extension of SR 4.0.2 to each performance after the initial performance. If ACTION A.1 is followed and the ACTION is not met within the completion time (including 25% extension of SR 4.0.2), condition B is entered. If ACTION A.2 is followed and completion time of 8 hours is not met, condition B is entered.

If, after entry into condition B, ACTION A.1 or A.2 is met, condition B is exited and operation may then continue in condition A.

1.0 USE AND APPLICATION

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2.0 SAFETY LIMITS

2 SAFETY LIMITS

2.0 SAFETY LIMITS

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2.0 SAFETY LIMITS

2.1 SAFETY LIMITS

SAFETY LIMITS are not applicable to the WCRRF.

2.0 SAFETY LIMITS

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3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4 LIMITING CONDITIONS FOR OPERATION

AND

SURVEILLANCE REQUIREMENTS

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

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3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.0 GENERAL APPLICATION

3.0 GENERAL LIMITING CONDITIONS FOR OPERATION

LCO 3.0.1 LCOs shall be met during the MODES or other specified conditions in the Applicability, except as provided in LCO 3.0.2.

LCO 3.0.2 Upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. If the LCO is restored before the specified completion time(s) expires, completion of the ACTION is not required, unless otherwise stated.

LCO 3.0.3 When an LCO is not met, and the associated Required ACTION(s) are not met or an associated Required ACTION is not provided, steps shall be initiated, within 1 Hour, to place each affected area in a MODE or other specified Condition to which the LCO does not apply. The affected area(s) shall be in that MODE within 12 hours.

Some LCOs apply in all MODES. In the event that LCO 3.0.3 is entered from one of these LCOs, steps shall be initiated within 1 hour to place the affected area(s) in COLD STANDBY. The affected area(s) shall be in COLD STANDBY within 12 hours. Where corrective measures are completed that permit operation in accordance with the LCO or ACTIONS, completion of the ACTIONS required by LCO 3.0.3 is not required. LCO 3.0.3 is applicable in all MODES. Exceptions to LCO 3.0.3 may be stated in the individual LCOs.

LCO 3.0.4 When an LCO is not met, a MODE or other specified condition in the Applicability shall not be entered, except when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS.

Exceptions to LCO 3.0.4 are stated in the individual LCOs. When an individual LCO states that LCO 3.0.4 does not apply, it allows entry into MODES or other specified conditions in the Applicability when the associated ACTIONS to be entered permit operation in the MODE or other specified condition for only a limited time.

LCO 3.0.5 Equipment removed from service or declared INOPERABLE to comply with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

LCO 3.0.6 When a support system is declared INOPERABLE, the supported systems are also required to be declared INOPERABLE. However, only the support system's ACTIONS are required to be entered, provided they reflect the support system's degraded safety condition. This is a clarification of the definition of OPERABILITY.

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

4.0 GENERAL SURVEILLANCE REQUIREMENTS

SR 4.0.1 SURVEILLANCE REQUIREMENTS shall be met during the MODES or other specified conditions for individual LCOs unless otherwise stated in the SURVEILLANCE REQUIREMENT. Failure to meet a SURVEILLANCE REQUIREMENT (whether such failure is experienced during the performance of the SURVEILLANCE REQUIREMENT or between performances of the SURVEILLANCE REQUIREMENT) shall constitute failure to meet the LCO. Failure to perform a SURVEILLANCE REQUIREMENT within the specified FREQUENCY shall constitute failure to meet the LCO, except as provided in SR 4.0.3. SURVEILLANCE REQUIREMENTS do not have to be performed on INOPERABLE equipment or variables outside specified limits.

SR 4.0.2 The specified FREQUENCY for each SURVEILLANCE REQUIREMENT is met if the SURVEILLANCE REQUIREMENT is performed within 1.25 times the interval specified in the FREQUENCY, as measured from the previous performance, or as measured from the time a specified condition of the FREQUENCY is met.

For FREQUENCIES specified as “once,” the above interval extension does not apply.

If a completion time requires a periodic performance of “once every…,” the above FREQUENCY extension applies to each performance after the initial performance.

Exceptions to SR 4.0.2 are stated in the individual SURVEILLANCE REQUIREMENTS.

SR 4.0.3 If it is discovered that a SURVEILLANCE REQUIREMENT was not performed within its specified FREQUENCY, compliance with the requirement to declare the LCO not met may be delayed from the time of discovery up to 24 hours or up to the limit of the specified FREQUENCY, whichever is less. This delay period is permitted to allow performance of the SURVEILLANCE REQUIREMENT.

If the SURVEILLANCE REQUIREMENT is not performed within the delay period, the LCO shall IMMEDIATELY be declared not met, and the applicable ACTIONS shall be entered. The completion times of the ACTIONS begin IMMEDIATELY on expiration of the delay period. When the SURVEILLANCE REQUIREMENT is performed within the delay period and the SURVEILLANCE REQUIREMENT is not met, the LCO shall IMMEDIATELY be declared not met, and the applicable ACTIONS shall be entered. The COMPLETION TIMES of the ACTIONS begin IMMEDIATELY on failure to meet the SURVEILLANCE REQUIREMENT.

SR 4.0.4 Entry into a MODE or other specified condition in the Applicability of an LCO shall not be made unless the LCO’s SURVEILLANCE REQUIREMENTS have been met within their specified FREQUENCY. This provision shall not prevent passage through or to MODES or other specified conditions in compliance with ACTIONS.

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.1 WCRRF INVENTORY

3.1 INVENTORY Limits

LCO: INVENTORY shall meet the following limits:

1. BUILDING TA-50-69 $\leq$ 800 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE.

   AND

2. WCRRF $\leq$ 1,800 PE-Ci.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: BUILDING TA-50-69 and WCRRF

ACTION

CONDITION	ACTIONS	COMPLETION TIME
A. BUILDING TA-50-69 INVENTORY > 800 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE	A.1 Restore INVENTORY to within limits.	1 hour
	OR	
	A.2.1 ENSURE combustible loading meets the requirements in LCO 3.4 in the affected area.	2 hours
	AND	
	A.2.2 Establish a FIRE PATROL in BUILDING TA-50-69.	2 hours
	AND	
	A.2.3 Place BUILDING TA-50-69 in WARM STANDBY	24 hours
	AND	
	A.2.4 Restore INVENTORY to within limits	7 days

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.1 WCRRF INVENTORY (cont.)

3.1 INVENTORY Limits (cont.)

ACTION (cont.)

CONDITION	ACTIONS	COMPLETION TIME
B. WCRRF INVENTORY > 1800 PE-Ci	B.1 Restore INVENTORY to within limits.	1 hour
	OR	
	B.2.1 Establish a FIRE PATROL in the affected area of WCRRF	2 hours
	AND	
	B.2.2 Place the WCRRF in WARM STANDBY	24 hours
	AND	
	B.2.3 Restore INVENTORY to within limits	7 days

4.1 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS		FREQUENCY
4.1.1	VERIFY BUILDING TA-50-69 INVENTORY will remain $\leq$ 800 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE	Prior to introducing any additional INVENTORY into BUILDING TA-50-69
4.1.2	VERIFY WCRRF INVENTORY will remain $\leq$ 1,800 PE-Ci.	Prior to introducing any additional INVENTORY into WCRRF

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.2 BUILDING TA-50-69 FIRE SUPPRESSION SYSTEM

3.2 BUILDING TA-50-69 Fire Suppression System

LCO: BUILDING TA-50-69 shall have an OPERABLE fire suppression system composed of the following:

1. An open and unobstructed flow path from the water supply tank to the BUILDING TA-50-69 and WCG sprinkler heads.

   AND

2. Riser gauge static pressure of 48 psig or greater at the base of the riser.

   AND

3. Water supply tank contains 100,000 gal. or greater.

   AND

4. The temperature of Building TA-50-69, including the attic space, is greater than 40 °F.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: BUILDING TA-50-69

ACTION

CONDITION	ACTIONS	COMPLETION TIME
A. The Fire Suppression System is INOPERABLE	A.1 Place INVENTORY in a SAFE CONFIGURATION	IMMEDIATELY
	AND	
	A.2 Establish a FIRE PATROL	2 Hours
	AND	
	A.3.1 Return the Fire Suppression System to OPERABLE	7 Days
	OR	
	A.3.2 Place the BUILDING TA 50-69 in COLD STANDBY	7 Days

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.2 FIRE SUPPRESSION SYSTEM (cont.)

4.2 Fire Suppression System

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS		FREQUENCY
4.2.1	VERIFY that the static gauge pressure is greater than or equal to 48 psig at the base of the riser.	DAILY
4.2.2	VERIFY that the water supply tank contains a minimum of 100,000 gal. of firewater available.	WEEKLY
4.2.3	VERIFY that the post indicator valves are locked in the open position.	MONTHLY
4.2.4	Perform a valve alignment inspection.	MONTHLY
4.2.5	Perform a hydrant flow test.	ANNUALLY
4.2.6	Perform a main drain test.	ANNUALLY
4.2.7	Calibrate the static pressure gauge on the FSS riser.	ANNUALLY
4.2.8	VERIFY that the temperature reading of TE/TI-001 and TE/TI-002 are greater than 40 °F and have been greater than 40 °F for at least 48 hours.	DAILY
4.2.9	Perform an instrument loop verification and interlock check for TE/TI-001 and TE/TI-002.	ANNUALLY
4.2.10	Verify that the valve, FS-V-017, to the WCG sprinkler head is in the open position.	WEEKLY

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

3.3.1 BUILDING TA-50-69 Confinement Ventilation System

LCO: BUILDING TA-50-69 confinement ventilation system shall be OPERABLE and be composed of the following:

1. BUILDING TA-50-69 shall maintain a negative pressure differential with respect to the atmosphere (as indicated by a building differential pressure less than -0.05 inches wc).

   AND

2. BUILDING TA-50-69 exhaust (FE-001 and FE-002) HEPA filters shall be OPERABLE as demonstrated by:

   a. The in-place efficiency of the HEPA filters shall be at least 99.95%.

   b. The pressure drop across any HEPA filter stage shall not exceed 3.5 inches wc.

   AND

3. BUILDING TA-50-69 CONFINEMENT INTEGRITY is intact.

   AND

4. The Uninterruptible Power Supply (UPS) shall provide power to required loads for at least 1 hour.

   AND

5. The ventilation control system shall activate an alarm when the differential pressure between the BUILDING TA-50-69 and the outside atmosphere is greater than -0.05 inches wc.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: BUILDING TA-50-69

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT (cont.)

3.3.1 BUILDING TA-50-69 Confinement Ventilation System (cont.)

ACTIONS: (cont.)

CONDITION	ACTIONS	COMPLETION TIME
A. Loss of negative pressure differential between the BUILDING TA-50-69 and outside atmosphere.	A.1 Shut down BUILDING TA-50-69 supply fans. **AND**	IMMEDIATELY
	A.2 Place INVENTORY in a SAFE CONFIGURATION. **AND** A.3 Restore BUILDING TA-50-69 negative pressure differential to OPERABLE status.	IMMEDIATELY 7 days
B. BUILDING TA-50-69 exhaust train HEPA filters (FE-002) are INOPERABLE.	B.1 Place INVENTORY in a SAFE CONFIGURATION. **AND** B.2 Shut down BUILDING TA-50-69 supply (HVA-1) and exhaust (FE-002) fans. **AND** B.3 Restore HEPA filters to OPERABLE status.	IMMEDIATELY IMMEDIATELY 7 days
C. BUILDING TA-50-69 exhaust train HEPA filters (FE-001) are INOPERABLE.	C.1 Shut down fan FE-001. **AND** C.2 Close the damper on FE-001.	IMMEDIATELY IMMEDIATELY

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT (cont.)

3.3.1 BUILDING TA-50-69 Confinement Ventilation System (cont.)

ACTIONS: (cont.)

CONDITION	ACTIONS	COMPLETION TIME
D. BUILDING TA-50-69 CONFINEMENT INTEGRITY INOPERABLE	D.1 Restore BUILDING TA-50-69 CONFINEMENT INTEGRITY. **OR** D.2 Place INVENTORY in a SAFE CONFIGURATION.	IMMEDIATELY 2 hours
E. UPS is INOPERABLE.	E.1 Place INVENTORY in a SAFE CONFIGURATION. **AND** E.2 Restore the UPS to an OPERABLE status.	IMMEDIATELY 7 days
F. Ventilation control system is INOPERABLE.	F.1 Place INVENTORY in a SAFE CONFIGURATION. **AND** F.2 Restore the ventilation control system to an OPERABLE status.	IMMEDIATELY 7 days
G. ACTIONS and associated completion time of Condition A, B, C, D, E, or F is not met.	G.1 Place BUILDING TA-50-69 in COLD STANDBY.	7 days

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT (cont.)

4.3.1 BUILDING TA-50-69 Confinement ventilation system

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS		FREQUENCY
4.3.1.1	Conduct an in-place HEPA filter aerosol efficiency test of the air exhaust system HEPA filters (FE-001 and FE-002) and demonstrate that in-place filter efficiency is greater than 99.95% for each filter plenum.	ANNUALLY **AND** After filter replacement or maintenance
4.3.1.2	VERIFY that the pressure drop across the air exhaust trains (FE-001 and FE-002) HEPA filters does not exceed 3.5 inches wc. (NOTE: the pressure drop across air exhaust train HEPA filters on FE-001 must be verified DAILY, only when the ventilation fan is on.)	DAILY
4.3.1.3	VERIFY BUILDING TA-50-69 pressure is negative with respect to the outside atmosphere as indicated by a building differential pressure less than -0.05 inches wc.	DAILY
4.3.1.4	VERIFY BUILDING TA-50-69 CONFINEMENT INTEGRITY exists	DAILY
4.3.1.5	Perform a CHANNEL CALIBRATION of the differential pressure gauge control loops used on the BUILDING TA-50-69 Confinement Ventilation System and the FE-002 HEPA filters used to perform SRs 4.3.1.2 and 4.3.1.3.	ANNUALLY
4.3.1.6	VERIFY the UPS is capable of providing power to required loads for at least 1 hour.	ANNUALLY
4.3.1.7	Perform a CHANNEL FUNCTIONAL TEST to VERIFY the ventilation control system activates an alarm when the differential pressure between BUILDING TA-50-69 and the outside atmosphere is greater than -0.05 inches wc.	QUARTERLY
4.3.1.8	Calibrate the differential pressure gauge on the FE-001 HEPA filter used to perform SRs 4.3.1.2.	ANNUALLY

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT (cont.)

3.3.2 WCG GLOVEBOX CONFINEMENT

LCO: WCG confinement ventilation system shall be OPERABLE and be composed of the following:

1. WCG atmosphere shall be maintained negative with respect to the main process area of BUILDING TA-50-69 (as indicated by a differential pressure less than – 0.1 inches wc).

   AND

2. The WCG (FE-003) HEPA filters shall be OPERABLE as demonstrated by:

   a. The combined in-place efficiency across the two stages of HEPA filters shall be at least 99.95%.

   b. The pressure drop across any HEPA filter stage shall not exceed 3.5 inches wc.

   AND

3. At least one GBE airlock door shall remain closed.

   AND

4. The ventilation control system shall activate an alarm when the differential pressure between the WCG and the main process area is greater than -0.1 inches wc.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: BUILDING TA-50-69

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT (cont.)

3.3.2 WCG GLOVEBOX CONFINEMENT (cont.)

ACTIONS (cont.)

CONDITION	ACTIONS	COMPLETION TIME
A. Loss of negative pressure between the WCG and BUILDING TA 50-69.	NOTE : Shutting down of the supply and exhaust fan will require entry into LCO 3.3.1.	
	A.1 Shut-down BUILDING TA-50-69 supply and exhaust fans.	IMMEDIATELY
	AND	
	A.2 Place INVENTORY in a SAFE CONFIGURATION.	IMMEDIATELY
	AND	
	A.3 Restore negative pressure to OPERABLE status.	7 days
B. Glovebox exhaust HEPA filter (FE-003) is INOPERABLE.	NOTE : Shuting down of the supply and exhaust fan will require entry into LCO 3.3.1.	
	B.1 Place INVENTORY in SAFE CONFIGURATION.	IMMEDIATELY
	AND	
	B.2 Shut down all BUILDING TA-50-69 supply and exhaust fans (including FE-003).	IMMEDIATELY
	AND	
	B.3 Restore HEPA filters to OPERABLE status.	7 Days
C. Both pairs of GBE airlock doors are open.	C.1 Fully close at least one GBE airlock door.	IMMEDIATELY

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT (cont.)

3.3.2 WCG GLOVEBOX CONFINEMENT (cont.)

ACTIONS (cont.)

CONDITION	ACTIONS	COMPLETION TIME
D. Ventilation control system is INOPERABLE.	D.1 Place INVENTORY in a SAFE CONFIGURATION. **AND** D.2 Restore the ventilation control system to an OPERABLE status.	IMMEDIATELY 7 days
E. ACTIONS and associated completion time of Condition A, B, C or D is not met.	E.1 Place BUILDING TA-50-69 in COLD STANDBY.	7 days

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT (cont.)

4.3.2 WCG GLOVEBOX CONFINEMENT

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS		FREQUENCY
4.3.2.1	Conduct a combined in-place HEPA filter aerosol efficiency test across the two stages of air exhaust system HEPA filters (FE-003) and demonstrate in-place filter efficiency is greater than 99.95% for the combined two stages of HEPA filters.	ANNUALLY **AND** After filter replacement or maintenance
4.3.2.2	VERIFY that the pressure drop across the FE-003 credited HEPA filter(s) does not exceed 3.5 in wc.	DAILY
4.3.2.3	VERIFY the WCG glovebox pressure differential is negative pressure with respect to the inside of BUILDING TA-50-69 as indicated by a differential pressure less than – 0.1 inches wc.	DAILY
4.3.2.4	ENSURE at least one GBE airlock door is closed.	DAILY
4.3.2.5	Perform a CHANNEL CALIBRATION of the differential pressure gauge control loops used on the WCG Confinement Ventilation System and the FE-003 exhaust HEPA filters used to perform SRs 4.3.2.2 and 4.3.2.3.	ANNUALLY
4.3.2.6	Perform a CHANNEL FUNCTIONAL TEST to VERIFY the ventilation control system activates an alarm when the differential pressure between the WCG and the main process area is greater than -0.1 inches wc.	QUARTERLY

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.4 COMBUSTIBLE LOADING

3.4 Combustible Loading

LCO: The combustible and flammable loading shall be:

1. ≤ 0.60 lb/ft^2 on average in BUILDING TA-50-69*.

   AND

2. No flammable liquids or gases and no combustible liquids with NFPA Flammability Rating greater than 1 shall be stored or used within BUILDING TA-50-69 when INVENTORY is in BUILDING TA-50-69, except three size 1 cylinders of P-10 gas and flammable or combustible liquids found in the TRU WASTE CONTAINER.

   AND

3. No combustibles shall be stored within the WCG exclusion zone*. The WCG exclusion zone is 10 ft around the WCG, up to the GBE, or up to the walls of Room 102, whichever is less.

   AND

4. No combustible fuel package inside Building TA-50-69 may be greater than 50 lb and must be separated from other combustibles by $\geq$ 6 ft*, excluding the change rooms/rest rooms.

   AND

5. Combustible material inside and within 10 ft of the exterior of the transportainers shall be limited to those materials and equipment necessary to accomplish required tasks.

* The following are excluded from the above limitations:

- INVENTORY that is in the WCG or staged in BUILDING TA-50-69.
- Combustible components of support equipment (e.g., wiring insulation, operator platforms and rubber mats) within the WCG Exclusion Zone and associated with WCG processing.
- Drum liners or wrapping around DEGRADED/LOSS OF INTEGRITY drums that are inside BUILDING TA-50-69 being loaded, and working amounts of materials necessary to complete bag on/off operations such as tape, cheesecloth, and extra operator gloves.
- Hydraulic fluid within the engineered, closed-loop containment systems.
- Combustible components associated with a forklift.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: BUILDING TA-50-69 and within 10 ft of transportainers

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.4 BUILDING TA-50-69 COMBUSTIBLE LOADING

3.4 Combustible Loading

ACTION

CONDITION	ACTIONS	COMPLETION TIME
A. Combustible Loading Exceeded.	A.1 Place INVENTORY in a SAFE CONFIGURATION.	IMMEDIATELY
	AND	
	A.2 Establish a FIRE PATROL.	2 hour
	AND	
	A.3 Restore combustible loading limits.	24 hour

4.4 Combustible Loading

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS		FREQUENCY
4.4.1	Perform a BUILDING TA-50-69 combustible material inventory inspection to VERIFY that the inventory is $\leq 0.60 lb/ft^2$ on average in BUILDING TA-50-69, allowing for the listed exclusions. (Performed by the FPE)	QUARTERLY
4.4.2	Perform a BUILDING TA-50-69 combustible material inventory inspection to VERIFY that no flammable liquids or gases, and no combustible liquids with NFPA Flammability Rating greater than 1, are stored or used when INVENTORY is in BUILDING TA-50-69. This excludes three size 1 cylinders of P-10 gas and flammable or combustible liquids found in the TRU WASTE CONTAINER.	DAILY
4.4.3	VERIFY that no combustibles are stored within the WCG exclusion zone, allowing for the listed exclusions.	DAILY
4.4.4	VERIFY no combustible fuel packages inside Building TA-50-69 are greater than 50 lb and that combustibles are separated from other combustibles by 6 ft excluding the change rooms/rest rooms and allowing for the listed exclusions.	DAILY
4.4.5	VERIFY that combustible materials and equipment inside and within 10 ft of the exterior of the transportainers are limited to those necessary to accomplish required tasks.	WEEKLY

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.5 WASTE CHARACTERIZATION GLOVEBOX DRUM LIFT FIXTURE

3.5 Waste Characterization Glovebox Drum Lift Fixture

LCO: The Waste Characterization Glovebox Drum Lift Fixture shall be OPERABLE, demonstrated by the following:

1. The drum lift fixture shall be capable of supporting a drum weighing at least 630 lbs during normal operations and PC-2 seismic events.

   AND

2. The drum lift fixture hoist holding brake shall be capable of stopping and holding a drum weighing at least 630 lbs when the lifting controls are released.

   AND

3. The drum lift fixture hoist shall be capable of limiting the lowering speed of a drum loaded to at least 630 lbs to 26 ft/min following loss of power.

MODE APPLICABILITY: OPERATION and WARM STANDBY

AREA APPLICABILITY: BUILDING TA-50-69

ACTIONS

CONDITION	ACTIONS	COMPLETION TIME
A. WCG Drum Lift Fixture INOPERABLE.	A.1 Place INVENTORY in a SAFE CONFIGURATION. **AND** A.2 Restore WCG drum lift fixture to OPERABLE.	IMMEDIATELY Prior to use

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.5 WASTE CHARACTERIZATION GLOVEBOX DRUM LIFT FIXTURE (cont.)

4.5 Waste Characterization Glovebox Drum Lift Fixture

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS		FREQUENCY
4.5.1	Weigh drum to be lifted to ensure it is less than 630 lb.	Prior to lift
4.5.2	VERIFY there is no visual indication of degradation of holding bands, holding band hinges including associated welds, and rollers that might affect lifting or seismic capability.	DAILY
4.5.3	VERIFY there is no visual indication of cracked welds, missing fasteners, loose parts, excessive wear or unusual deformation of the drum lift fixture that might affect lifting or seismic capability.	ANNUALLY
4.5.4	Perform a drum lift fixture dummy load test of at least 788 lb.	ANNUALLY
4.5.5	Perform a drum lift fixture hoist holding brake test to VERIFY it is capable of stopping and holding a drum weighing at least 788 lb when the lifting controls are released.	ANNUALLY
4.5.6	Perform a drum lift fixture hoist test to VERIFY it is capable of limiting the lowering speed of a drum loaded to at least 788 lb to 26 ft/min following loss of power.	ANNUALLY

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.6 BREACHING UNVENTED, SEALED 30- to 5-GALLON METAL WASTE PACKAGES IN WCG

3.6 Breaching Unvented, Sealed 30- to 5-Gallon Metal Waste Packages in WCG

LCO: When processing a positively sealed 30- to 5-gallon metal WASTE PACKAGE in the WCG, the following shall be fulfilled:

1. The parent 55-gallon drum bagged-on to the WCG and metal WASTE PACKAGE shall be grounded when the metal WASTE PACKAGE is breached and for 30 minutes after the removal of the lid and lid restraining device.

MODE APPLICABILITY: OPERATION

AREA APPLICABILITY: BUILDING TA-50-69

ACTION

CONDITION	ACTIONS	COMPLETION TIME
A. The parent 55-gallon drum bagged-on to the WCG and/or metal WASTE PACKAGE is not grounded when the metal WASTE PACKAGE is breached and for 30 minutes after the removal of the lid and lid restraining device.	A.1 Cease all WCG operations for 30 minutes. **AND** Note: ACTIONS A.2.1 through A.2.3 are performed only if the lid restraining device is installed on the breached metal WASTE PACKAGE.	IMMEDIATELY
	A.2.1 If lid restraining device is installed, apply grounding strap. **AND** A.2.2 Remove lid restraining device and lid. **AND** A.2.3 Cease all WCG operations for an additional 30 minutes.	IMMEDIATELY Following COMPLETION OF ACTION A.1 IMMEDIATELY Following COMPLETION OF ACTION A.2.1 IMMEDIATELY Following COMPLETION OF A.2.2

3/4 LIMITING CONDITIONS for OPERATION AND SURVEILLANCE REQUIREMENTS

4.6 SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS		FREQUENCY
4.6.1	VERIFY that the parent 55-gallon drum bagged-on to the WCG and metal WASTE PACKAGE are grounded.	Prior to breaching the WASTE PACKAGE

5.0 ADMINISTRATIVE CONTROLS

5 ADMINISTRATIVE CONTROLS

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5.0 ADMINISTRATIVE CONTROLS

5.1 PURPOSE

5.1.1 The purpose of the ADMINISTRATIVE CONTROLS (ACs) is to state the provisions relating to organization and management, procedures, record keeping, review and assessment, reporting, and safety management programs necessary to ensure safe operation of WCRRF.

5.1.2 Unless otherwise noted, these ACs are applicable to the WCRRF at all times.

5.2 ORGANIZATION AND MANAGEMENT RESPONSIBILITIES

5.2.1 Facility Operations Director

The Facility Operations Director for the WCRRF is:

1) Responsible for nuclear safety at the WCRRF and is the LANL point of contact for all issues on nuclear safety.
2) The authority designated to direct emergency actions per 10 CFR 830.205(b): "A contractor may take emergency actions that depart from an approved technical safety requirement when no ACTIONS consistent with the technical safety requirement are immediately apparent, and when these actions are needed to protect workers, the public or the environment from imminent and significant harm." DOE will be notified when emergency actions have taken place.

5.2.2 Facility Operations Director or Designee

The Facility Operations Director is responsible for the following:

1) Overall WCRRF operations, except as may be assigned through the facility tenant agreement per LANL requirements, or delegation in writing the succession of this responsibility during any absence.

2) Operating the WCRRF in accordance with approved TSRs.

3) Facilitating and controlling physical changes in WCRRF configuration and coordinating the activities of all work groups within the WCRRF.

4) Ensuring that on-call support personnel (as specified in Table 5.2.3-1) are assigned and that technical support personnel will be available to provide technical assistance to the operating staff.

5) Ensuring that WCRRF operations are carried out by qualified personnel according to written procedures.

5.0 ADMINISTRATIVE CONTROLS

5.2 ORGANIZATION AND MANAGEMENT RESPONSIBILITIES (cont.)

5.2.3 Minimum Staffing Requirements

The following are the minimum staffing requirements for operations at the WCRRF.

Table 5.2.3-1. Minimum Operating Shift Complement

BUILDING TA-50-69 MODE	Shift Operations Manager	Shift Operations Supervisor	Waste Handling Technician	Radiological Control Technician (RCT)	FIRE PATROL	STATIONARY FIRE WATCH
OPERATIONS	R	C	C=4	C=2	R	C/None
WARM STANDBY	R	R	R	R	R	C/None
COLD STANDBY	None	None	None	None	None	None

C = at TA-50.

R = on call and responds within 2 hr.

C/None = a FIRE WATCH is required in OPERATIONS and WARM STANDBY MODE when the WCG INVENTORY is > 300 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE. When the WCG INVENTORY is ≤ 300 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE, a dedicated FIRE WATCH is not required.

5.3 TECHNICAL SAFETY REQUIREMENTS

5.3.1 General Requirements

The TSRs:

1) Are prepared, independently reviewed, and approved in accordance with 10 CFR 830.205, *Technical Safety Requirements*, and DOE G 423.1-1, *Implementation Guide for Use in Developing Technical Safety Requirements.*

2) Define the controls to ensure that the WCRRF remains within the DSA. The TSRs formally document the requirements in the following sections:

   a. Use and application provisions;

   b. LIMITING CONDITIONS FOR OPERATION and SURVEILLANCE REQUIREMENTS;

   c. ADMINISTRATIVE CONTROLS

5.0 ADMINISTRATIVE CONTROLS

5.3 TECHNICAL SAFETY REQUIREMENTS (cont.)

5.3.1 General Requirements (cont.)

d. Design Features; and

e. Bases statements.

3) Be complied with except for reasonable action taken in an emergency when this action is immediately needed to protect the public health and safety and when ACTION consistent with the TSRs is not immediately apparent in accordance with Section 5.2.1(2).

4) Be maintained as a controlled document.

5) Be procedurally controlled in accordance with LANL requirements, to require that NNSA approve changes prior to incorporation into the TSR.

5.3.2 Compliance

The Facility Operations Director through the Operations Manager or designee is responsible for ensuring that the requirements of the WCRRF TSRs are met. Compliance is DEMONSTRATED by the following:

1) Operating within the LCOs and associated SRs during their applicability.

2) Operating within the ACTIONS of LCOs when required.

3) Performing all SRs when required.

4) Establishing, implementing, and maintaining the required ACs.

5.3.3 Violation of a TSR

VIOLATIONS of the TSR occur as the result of the following circumstances:

1. Failure to complete an ACTION statement within the required COMPLETION TIMES following:
   - Exceedance of an LCO, or
   - Failure to successfully meet the SR.

5.0 ADMINISTRATIVE CONTROLS

5.3 TECHNICAL SAFETY REQUIREMENTS (cont.)

5.3.3 Violation of a TSR (cont.)

2. Failure to perform a surveillance or ISI within the required FREQUENCY.

> When equipment or a component fails an SR, the ACTION required by the TSR for the inoperable equipment or component is taken. Failure to take the required ACTION is a TSR VIOLATION. When a DESIGN Feature fails an ISI, that failure is new information which SHALL be evaluated for initiation of the Potential Inadequacy of the Safety Analysis (PISA) process. Failure of an ISI is not a TSR VIOLATION, except as provided in item 4 below. If an SR or ISI is not performed within its required time interval, including any extension allowed by SR 4.0.2 or DF 6.1, it is considered to be a VIOLATION of the TSR.

3. Failure to comply with an AC statement.

- There are two different types of failures to comply with an AC statement. The first type is when the ADMINISTRATIVE CONTROL is directly violated, as would be the case for a directive language SPECIFIC ADMINISTRATIVE CONTROL requirement. A single failure to comply constitutes a TSR VIOLATION.

- The second type of AC VIOLATION is when the intent of a program included in the ADMINISTRATIVE CONTROLS is not fulfilled. A single non-compliance would not necessarily constitute a TSR VIOLATION. To qualify as a TSR VIOLATION, the failure to meet the intent of the referenced program would need to be significant enough to render the DOCUMENTED SAFETY ANALYSIS summary invalid.

4. Failure of a DESIGN FEATURE to meet its respective performance criteria, functional requirements, or safety function following a return to service after a planned or inadvertent modification. Damage from an accident or natural phenomena event or wear or age-related degradation is not considered a modification.

5.3.4 Response to a TSR Violation

If a TSR VIOLATION occurs, the following actions SHALL be taken:

1. Notify DOE/NNSA of the VIOLATION in accordance with DOE requirements.

2. Prepare an occurrence report in accordance with DOE requirements.

5.3.5 Conditions Outside TSR

In a declared emergency, if a situation develops that is not addressed by the TSR, site personnel are expected to use their training and expertise to take ACTIONS to correct or mitigate the situation. Also, site personnel may take ACTIONS that depart from the requirements of a TSR provided (a) an emergency situation exists; (b) these ACTIONS are needed IMMEDIATELY to protect workers, the public, or the

5.0 ADMINISTRATIVE CONTROLS

environment from imminent and significant harm; and (c) no ACTION consistent with the TSR is IMMEDIATELY apparent. Such ACTION must be approved by a person in authority as designated in the TSRs for nonreactor nuclear facilities. (For WCRRF, the person in authority is the EWMO FOD; this authority may be delegated by the FOD). If emergency ACTION is taken, both a verbal notification should be made to the responsible head of the field element and a written report made to the Cognizant Secretarial Officer (CSO) within 24 hours.

5.4 PROCEDURES

Procedures are established, implemented, and maintained in accordance with LANL requirements governing conduct of operations. Facility-specific guidance for initiating, preparing, revising, reviewing, approving, controlling, and issuing operating procedures will be provided.

Procedures are not limited to those items specifically identified as procedure types (for example, operating, chemistry, system, test, surveillance, and emergency plan) but could include anything described in the Safety Basis that defines or describes activities or controls over the conduct of work. Changes to these activities or controls qualify as changes to procedures as described in the Safety Basis, and therefore must be evaluated as a potential Unreviewed Safety Question (USQ).

5.0 ADMINISTRATIVE CONTROLS

5.5 REVIEW AND AUDIT

5.5.1 General

This section summarizes the programs that ensure independent oversight, safety review, USQ determination, and appraisal of safety performance in accordance with LANL requirements.

5.5.2 Management Self-Assessments

A program is implemented in accordance with LANL requirements, requiring that line management periodically review activities to ensure that they are conducted in a safe manner. Examples of elements that should be reviewed include but are not limited to:

1) Procedures,
2) USQ determinations,
3) Programs,
4) Building/facility changes and modifications,
5) Facility operation,
6) Maintenance and testing,
7) Laboratory, DOE, and industry issues for potential generic safety significance, and
8) TSR compliance.

5.5.3 Independent Reviews

Reviews are conducted by individuals independent of the line management organizations. The objective of the independent review program is to assist line management in assessing work performance and identify areas for improvement. Examples of subjects that independent reviews should evaluate include but are not limited to:

1) TSR implementation,
2) USQ determinations,
3) Proposed changes to the TSRs,
4) Occurrence reports, and
5) Configuration management control program implementation.

5.0 ADMINISTRATIVE CONTROLS

5.5 REVIEW AND AUDIT (cont.)

5.5.4 Audits

A Laboratory audit program is established and conducted by a group independent of the facility or operations personnel to assess whether operations are in accordance with the WCRRF Safety Basis, including these TSRs, and Laboratory requirements. Examples of subjects the audit program should include are the following:

1) conformance with the TSRs,
2) training and qualification of the facility and operations staff,
3) program implementation,
4) effectiveness of corrective actions, and
5) adherence to Quality Assurance Program requirements.

5.6 PROGRAMS (SAFETY MANAGEMENT)

5.6.1 Unreviewed Safety Question

The USQ program is implemented as a part of the Configuration Management Program and maintained in accordance with LANL requirement (OST300-00-06B, *LANL Unreviewed Safety Question Procedure*, or successor documents). As required by 10 CFR 830.203(f), a summary of all USQ determinations performed since the last submittal will be submitted to DOE on an annual basis.

5.6.2 Emergency Preparedness Program

An emergency preparedness program is implemented and maintained in accordance with the LANL requirements (LPR403-00-00/LIR403-00-01, *Emergency Management/Los Alamos National Laboratory Emergency Management*, or successor documents). The program addresses emergency preparedness planning including activation of emergency organizations, notification processes, protective actions, emergency facilities and equipment, training and exercises, recovery actions, and assessment actions. The following element of the Emergency Preparedness program is implemented in WCRRF procedures:

- Upon detection of an airborne release of radioactive contamination in BUILDING TA-50-69 workers will evacuate per facility procedures and, if the BUILDING TA-50-69 exhaust fans are INOPERABLE, the vacuum pumps for the radiological monitoring equipment (CAMS and fixed-head air samplers) will be de-energized by the power cut-offs located outside BUILDING TA-50-69.

5.0 ADMINISTRATIVE CONTROLS

5.6 PROGRAMS (SAFETY MANAGEMENT) (cont.)

5.6.3 Conduct of Operations

A Conduct of Operations program is implemented and maintained in accordance with LANL requirements on Conduct of Operations (IMP 315/ISD 315-1, *Conduct of Operations/Conduct of Operations Manual*, or successor documents), which requires performance criteria be considered when accepting and/or authorizing work, identifying the risks to operations, and developing and implementing the controls needed to perform the work safely and securely.

5.6.4 Nuclear Criticality Safety Program

The Nuclear Criticality Safety Program is implemented to prevent inadvertent nuclear criticality and to provide proper response to an inadvertent nuclear criticality. General limits and controls (engineered and administrative) are applied to fissile material operations to ensure subcritical configurations under all normal and credible abnormal conditions whenever fissile materials are present. The LANL Nuclear Criticality Safety Program is implemented and maintained for WCRRF operations in accordance with LANL requirements (IPP130/ISD130-1, *Nuclear Criticality Safety/Nuclear Criticality Safety Program Manual*, or successor documents).

5.6.5 Fire Protection Program

A fire protection program will be established, maintained and implemented based on criteria established in LANL requirements (LIR402-910-01, *LANL Fire Protection Program,* or successor documents). This program develops and maintains effective fire protection and control measures for the protection of personnel and structures within WCRRF. The Fire Protection Program includes controls such as an ignition source control program, which is approved by a fire protection engineer.

5.6.6 Radiation Protection Program

A Radiation Protection Program is established and maintained based on the criteria in LANL requirements (ISD121-1, *Radiation Protection*, or successor documents). These documents comply with the requirements of 10 CFR 835, Occupational Radiation Protection. Radiation protection training is required to help ensure that radiation doses are maintained as low as reasonably achievable (ALARA) at the WCRRF.

5.0 ADMINISTRATIVE CONTROLS

5.6 PROGRAMS (SAFETY MANAGEMENT) (cont.)

5.6.7 Maintenance Program

The WCRRF has established a maintenance program based on the criteria established in LANL requirements (ISD951-1, *LANL Conduct of Maintenance Manual*, or successor documents). At the WCRRF, maintenance shall be managed in accordance with the policy on using the graded approach by a combination of the following:

1) Review and approval of applicable maintenance procedures and instructions in accordance with LANL requirements;
2) Monitoring maintenance work performed on the WCRRF institutional and programmatic equipment;
3) Maintenance of safety SSCs and forklifts that handle TRU WASTE CONTAINERS.

The following element is included in this program:

- The lightning protection system is maintained according to the following NFPA 780 requirements:

    1) Following a lightning strike or on an Annual basis, the LPS is visually inspected for signs of degradation as indicated by:

        a) There are no loose connections that might result in high resistance;

        b) No part of the system has been degraded by corrosion;

        c) All down conductors and grounding electrodes are intact (continuity exists);

        d) All conductors and system components are fastened securely to the mounting surfaces;

        e) There have not been additions or alterations to the protected structure that would require additional protection; and,

        f) There is no visual indication of damage to surge protection.

    2) Tests every 3 years to ensure continuity of those parts of the system that were concealed (built-in) during the initial installation and that are not now available for visual inspection.

    3) Tests every 3 years to ensure the ground resistance of the grounding electrode termination system and its individual grounding electrodes are less than 200 ohms.

    Basis: Reduces frequency for a lightning strike upon Building TA-50-69 causing a fire.

5.6.8 Configuration Management Program

The Configuration Management Program is implemented and maintained for the WCRRF in accordance with LANL requirements (LIR240-01-01, or successor documents). The purpose of this program is to

5.0 ADMINISTRATIVE CONTROLS

identify and document the technical baseline of configuration control items and to protect equipment integrity. LANL requirements ENSURE that changes to the technical baseline are properly identified, developed, assessed (technically reviewed and validated), approved, scheduled, implemented, and documented.

5.6.9 Hazardous Material and Waste Management

A hazardous material and waste management program is established and maintained based on LANL requirements (LIR402-510-01, *Chemical Management,* and LIR404-00-02, *General Waste Management Requirements,* or successor documents). The program controls personnel exposure to hazardous materials by identifying and limiting contact with hazardous materials, adhering to established occupational exposure limits, implementing administrative and engineered controls, and using personal protective equipment.

5.6.10 Hoisting and Rigging Program

A hoisting and rigging program is established and maintained in accordance with LANL requirements (ISD101-25, *Cranes, Hoists, Lifting Devices, and Rigging Equipment*, or successor documents). The program ensures that lifting devices used for moving TRU WASTE CONTAINERS in BUILDING TA-50-69 meet the load rating required. The rigging also must be inspected and tested. Implementing this program reduces the likelihood of dropping a container or component during TRU WASTE CONTAINER handling operations.

The following elements/subprograms of the Hoisting and Rigging Program are implemented in a facility procedure:

- Use of spotters during TRU WASTE CONTAINER forklift operations.

5.6.11 Quality Assurance Program

A QA Program is established, implemented, and maintained at the WCRRF. The QA Program controls the integrity and reliability of Safety-Class (SC)/Safety-Significant (SS)-SSCs and implementation of other safety management programs. The elements of the WCRRF QA Program follow LANL requirements (IP330, *Quality Assurance Program,* or successor documents).

5.0 ADMINISTRATIVE CONTROLS

5.7 OCCURRENCE REPORTING

An occurrence reporting program shall be established, implemented, and maintained for reporting operational occurrences. Occurrence reports will be prepared in accordance with LANL requirements (ISD322-3, *Manual for Communicating, Investigating, and Reporting Abnormal Events*, or successor documents). This program satisfies the requirements of DOE M 232.1-2, *Occurrence Reporting and Processing of Operations Information*, in reporting operations information. Investigations of occurrences having environmental protection, safety, or health-protection significance are performed in compliance with DOE O 225.1A, *Accident Investigation.*

5.8 QUALIFICATION AND TRAINING

The WCRRF training and qualification program is in accordance with LANL requirements (ISD781-1, *Conduct of Training Manual*, or successor documents) and DOE O 5480.20A. The program ensures that personnel who are responsible for WCRRF operations, process operations, vehicle operation, maintenance, and technical support are trained and qualified/certified, as applicable, to accomplish their safety-related responsibilities. Line management ensures that personnel receive the training required through the use of a Training Implementation Matrix in accordance with DOE O 5480.20A. The training program includes the following elements:

- Training and qualification for forklift operators.

5.9 DOCUMENT CONTROL

WCRRF operations and facility records (including TSR compliance documentation) shall be retained in accordance with the WCRRF QA Program and LANL requirements (IPP1020, *Document Control and Records Management*, or successor documents).

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS

The following SPECIFIC ADMINSTRATIVE CONTROLS shall be followed.

5.10.1 Fire Protection Program

5.10.1.1 Vehicle Fuel Restrictions

Safety Function: The prohibition of propane, gasoline, and diesel-fueled vehicles in the WCRRF prevents explosions and minimizes the potential for fires that will impact INVENTORY.

SACs: Propane, gasoline, or diesel-fueled vehicles shall not be used anywhere at the WCRRF when INVENTORY is present at the WCRRF. Exceptions: (1) Emergency vehicles in the case of any emergency. (2) Equipment with less than 5 gal. of fuel may be used for grounds maintenance and for snow and ice removal.

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.1 Fire Protection Program (cont.)

5.10.1.1 Vehicle Fuel Restrictions (cont.)

Basis: *Propane, gasoline and diesel-fueled vehicles operating inside of the WCRRF represent a large energy source that can contribute fuel to a fire or generate missiles. Prohibition on these types of vehicles mitigates the magnitude of potential fires near WASTE CONTAINERS. An exception to respond to emergencies, or for grounds maintenance and snow removal (vehicle with up to 5 gal.), is necessary to protect the facility and to efficiently conduct facility operations. This value was considered adequate and reasonable for grounds maintenance and snow removal activities.*

5.10.1.2 Hotwork Prohibition

Safety Function: The control of hotwork reduces the probability of a fire igniting that would threaten TRU waste.

SAC: No hotwork may be performed in BUILDING TA-50-69 when INVENTORY is present.

Basis: *Hotwork activities are a common ignition source of industrial fires. Prohibiting hotwork while* INVENTORY *is present in the process areas eliminates a major contributor to the FREQUENCY of fire events that can result in the release of material.*

5.10.1.3 Diesel Generator Refueling Exclusion

Safety Function: This control prevents fuel pool fires associated with the diesel generator refueling from affecting INVENTORY in TA-50-69.

SAC: Refueling of the diesel generator is prohibited when INVENTORY is in BUILDING TA-50-69.

Basis: *Large leaks that occur during refueling of the diesel fuel generator can contribute fuel to a fire that can spread to BUILDING TA-50-69, affecting* INVENTORY *within BUILDING TA-50-69. Prohibition of refueling the diesel generator while* INVENTORY *is inside BUILDING TA 50-69 prevents this occurrence. The diesel generator is located far away from transportainers on the south side of BUILDING TA-50-69, so any diesel fuel spills will not affect* INVENTORY *that is staged in the transportainers.*

5.10.1.4 Vehicle Access System

Safety Function: The implementation of a vehicle access system prevents vehicle impacts and subsequent fuel pool fires that could impinge upon INVENTORY in BUILDING TA-50-69 and TRU WASTE CONTAINERs staged in transportainers.

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.1 Fire Protection Program (cont.)

5.10.1.4 Vehicle Access System (cont.)

SACs**:**

1. When the facility is not in COLD STANDBY, the vehicle access system barriers must be located such that the impact vehicle stops at least 25 ft from INVENTORY staged in BUILDING TA-50-69 or in transportainers to prevent up to a 100-gal. diesel fuel pool fire from impinging on WASTE CONTAINERS.

2. The gates of the vehicle access system may be removed when the facility is in COLD STANDBY and at any time for emergency access. Delivery of the TRU WASTE CONTAINERS occurs at the gates of the vehicle access system. When these transport activities take place, the transportation vehicle blocks the entrance of the gate to inadvertent vehicle impact, and during these times it is acceptable to temporarily remove the gate.

Basis: *The Vehicle Access System barriers are passive design features and are included in the design features portion of the TSR document. As passive design features, the vehicle barriers are not expected to change or to experience operability degradation over time. A separation distance of 25 ft between the vehicle fuel and TRU WASTE CONTAINERS prevents a 100-gal. diesel fuel pool fire from impinging upon TRU waste.*

5.10.1.5 Use of Drum Lid Restraints when Breaching Unvented, Sealed 30- to 5-gallon WASTE PACKAGES in WCG

Safety Function: The safety function of a lid restraining device is to provide physical protection in the WCG in case of a lid ejection, and to minimize material release (e.g., prevents unconfined burning of material), when breaching an unvented, sealed 30- to 5-gallon WASTE PACKAGE.

1. A lid restraining device shall be installed onto unvented, sealed 30- to 5-gallon WASTE PACKAGES when the lid is removed. Prior to breaching the WASTE PACKAGE, the lid restraining device shall be inspected for degradation and proper installation.

2. After the removal of the lid and lid restraining device, WCG operations shall be ceased for 30 minutes.

Basis: *The use of a lid restraining device mainly protects glovebox operators working within the WCG, from any flying debris from a lid ejection, due to a pressurized or deflagrating WASTE PACKAGE. In addition, the glovebox is protected from flying debris breaching its confinement integrity.*

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.1 Fire Protection Program (cont.)

5.10.1.5 Use of Drum Lid Restraints when Breaching Unvented 30-gallon Drums in WCG (cont.)

DOE Standard 5506 Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities (DOE 2007) cites results of Idaho Drum Deflagration Tests. Several drums were filled with representative combustible/metal waste matrices; the drums were also pressurized with a flammable gas mixture comprised of oxygen, hydrogen, and nitrogen. The test drums were then subjected to sparks, a drill bit puncture, or a 12-foot drop. The results showed that puncturing or dropping the test drum did not result in a deflagration. In the 12-foot drop test, when the drum impacted the ground, it rotated a complete 180 degrees, yet it did not deflagrate nor did it show signs that a fire occurred within the drum. This indicates that movement of metal items within the test drums did not produce enough of a spark to ignite the flammable gas mixture. Extending this result to WCG operations, it is not expected that handling an unvented, sealed drum, such as removing the lid from the drum, will most likely not cause the drum to deflagrate if a flammable gas mixture is present within the drum. The drums that deflagrated in the Idaho tests, were the ones that were impacted with a soft (20 milli-Joules) or hard (5 Joules) spark. Extending this particular result to WCG operations indicates that by preventing the occurrence of sparks, a deflagration will not occur if a flammable gas mixture exists with the WASTE PACKAGE when it is breached.

When processing unvented, sealed WASTE PACKAGES within the WCG, the use of non-sparking tools (SAC 5.10.1.6) and grounding the metal WASTE PACKAGE and parent 55-gallon drum (LCO 3.6) will prevent the introduction of sparks when breaching the unvented, sealed WASTE PACKAGE. Again, as indicated by the drum deflagration tests, spark production within the waste matrix by metal waste items rubbing against each other by the movement of an unvented, sealed container is not sufficient to cause a deflagration of a flammable gas mixture within the container. However, unvented, sealed WASTE PACKAGES should be handled with care.

The lid restraining device has been demonstrated through testing or analysis to restrain an ejected lid during a drum deflagration. After the unvented, sealed WASTE CONTAINER is breached, the lid and lid restraining device can be removed.

LANL Calc. CALC-07-50-069-000-0005-M-R-0, demonstrates that the maximum hydrogen concentration of 7.4% is possible in the WCG if 90% of a pressurized (11 psig) 30-gallon WASTE PACKAGE is instantaneously released. The calculation cites that the overall concentration at the exhaust fan will not exceed flammable hydrogen concentrations due to the larger ductwork volume and ventilation flow rate at the common WCG and GBE exhaust header. The calculation further demonstrates that this type of instantaneous release is not possible due to the glovebox ventilation and drum configuration. The WCG ventilation sweeps away the hydrogen as it diffuses from the WASTE PACKAGE, and after 30 minutes and with minimal WCG air flow (35 cubic foot per minute), the hydrogen concentration in the WCG and at the WASTE PACKAGE opening are below flammable hydrogen concentrations.

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.1 Fire Protection Program (cont.)

5.10.1.5 Use of Drum Lid Restraints when Breaching Unvented 30-gallon Drums in WCG (cont.)

This control is only applicable to unvented, sealed WASTE PACKAGES with a volume of 30- to 5-gallons. Using the same calculations in LANL Calc. CALC-07-50-069-000-0005-M-R-0, the WCRRF Safety Basis Addendum No. 2, shows that breaching unvented, sealed WASTE PACKAGE with volumes smaller than 5-gallons will not cause the overall WCG atmosphere to experience a flammable gas concentration near 25% of the hydrogen lower flammability limit. The application of a lid restraining device on these smaller containers is not practical; however, the control for the use of non-sparking tools and the de-energizing of WCG receptacles, via SAC 5.10.1.6, is considered sufficient to prevent any flammable gas mixture to deflagrate in WASTE PACKAGES smaller than 5-gallons, and thus lid ejection from deflagration will not occur. Lid ejection from breaching a pressurized WASTE CONTAINER less than 5-gallons is expected to not cause physical damage.

5.10.1.6 Use of Non-Sparking Tools and Processes / De-energization of WCG Electric Receptacles when Breaching Unvented, Sealed WASTE PACKAGES within the WCG

Safety Function: When breaching unvented, sealed WASTE PACKAGES within the WCG, the use of non-sparking tools or processes, and the de-energization of WCG receptacles, prevents the occurrence of sparks, thereby preventing the ignition of a potentially flammable atmosphere with the WCG.

SACs:

1. Tools and processes used to breach an unvented WASTE PACKAGES shall be non-sparking.

2. Prior to breaching the unvented WASTE PACKAGE within the WCG, receptacles in the WCG shall be de-energized.

3. The WCG receptacles shall not be re-energized until 30 minutes has elapsed after removing the lid and lid restraining device.

Basis: *This control is credited with preventing the occurrence of sparks (ignition sources) during the breach of unvented WASTE PACKAGES, thereby reducing the probability of a deflagration or explosion.*

Flammable gas shall not be capable of reaching any energized components via the same mechanism that the contamination within the WCG is confined.

The basis of the 30-minute wait time is discussed in SAC 5.10.1.5.

Spark-producing tools may be placed aside in the WCG, and not handled, when non-sparking tools are required. When the use of non-sparking tools is not required, they may also be stored within the WCG. The spark-producing and non-sparking tools shall be distinguished from each other.

5.0 ADMINISTRATIVE CONTROLS

5.10.1.7 Extra Fire Controls for High-or MAR Processing in WCG

1. **Safety Function:** A STATIONARY FIRE WATCH and the use of fire control agents by trained operators mitigates the effects of a fire in the WCG during the processing of a parent drum containing greater than 300 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE of EQUIVALENT COMBUSTIBLE WASTE, in coordination with the STATIONARY FIRE WATCH.

Basis: *Operational experience at LANL indicates that glovebox fires to date have been localized and adequately addressed as incipient fires by glovebox operators. This control supplements the WCG Fire Suppression System and ensures that the appropriate fire suppression tools are in place to allow the STATIONARY FIRE WATCH or glovebox operator to manually respond upon detection of a small, early developing fire that could be caused by pyrophoric material contained within the waste being processed. Carbon spheroids and Met-L-X are recommended fire-fighting agents and are listed in Table A.13.3.3 of NFPA 484, Standard for Combustible Metals. Three containers are required in the glovebox to provide ready access throughout the glovebox to fight fires. Each container shall have sufficient material to completely cover a small pyrophoric metal fire (based on engineering judgment, this is estimated to be 1 liter in each container). When TRU waste containing > 300 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE is in the WCG, because of the higher potential consequences of a fire involving this material, a dedicated STATIONARY FIRE WATCH shall be in place while glovebox operations occur. Operators or support personnel are trained to perform a STATIONARY FIRE WATCH and to use the fire-fighting equipment and agents provided in the WCG. The training ensures that the WCG operator and STATIONARY FIRE WATCH can detect small, early developing fires, are aware of the hazards, and can manually apply the fire suppression material to small, early-developing fires within the WCG.*

5.0 ADMINISTRATIVE CONTROLS

5.10.2 Hazardous Material and Waste Management Program

5.10.2.1 Transportainer Placement

Safety Function: Restricting the transportainer staging height minimizes the likelihood of a TRU-WASTE CONTAINER failing if the transportainer supports fail. Locating the transportainers away from BUILDING TA-50-69 prevents TRU-WASTE CONTAINERS from being impacted by a building collapse.

SACs:

1. Support structures shall not elevate transportainers containing TRU WASTE CONTAINERS greater than 4 ft above ground level.
2. Transportainers containing INVENTORY shall be located greater than 35 ft away from BUILDING TA-50-69.

***Basis**: This height limit protects the safety function of the containers staged in the transportainer. The DOT 7A TRU WASTE CONTAINERS are rated to survive a 4-ft fall without release of contents. Transportainers with INVENTORY must also be located away from BUILDING TA-50-69 to prevent impact from seismic collapse of the building. The distance of 35 ft was selected because it is approximately 1½ times the building height.*

5.10.2.2 TRU WASTE CONTAINER Staging Practices

Safety Function: The restrictions on TRU WASTE CONTAINERS stacking and lift height prevent the release of material by reducing the likelihood of a container failure caused by a drop from an elevated position.

SAC: TRU WASTE CONTAINERS shall not be stacked and shall not be lifted higher than 4 ft, excluding the WCG drum lift and lifts during loading or unloading from delivery trucks.

***Basis:** TRU WASTE CONTAINERS are rated for 4-ft drops. This control also protects the design basis for the TRU WASTE CONTAINERS, which are tested and certified to survive a 4-ft drop with their functional requirement of containment intact. Delivery truck beds used at LANL are approximately 51 inches above grade. Lift heights when TRU-WASTE CONTAINERS are loaded or unloaded from delivery trucks are slightly greater than 51 inches. Energy causes damage to a drum as a result of a drum drop and the TRU-waste drums have been tested to 4000 ft.-lbs. (1000-lb. drum dropped from a height of 4 ft.); for an equivalent amount of damage to a 630-lb. drum, the drums would have to be dropped from about 6.3 ft. (75.6 inches). SWBs are more robust than drums, so can be expected to survive drops during unloading and loading operations. In addition, the requirement for trained and qualified forklift operators and spotters minimizes the probability of TRU-WASTE CONTAINER drops during delivery truck loading or unloading operations. Therefore, the TRU-WASTE CONTAINER lift height incurred during loading or unloading from delivery trucks is excluded from the prohibition on lifts greater than 4 ft. The WCG drum lift requires lifts of 61 inches and is a safety-significant control to prevent and to mitigate the consequences of drum drop events and compensates for lifts of DEGRADED or LOSS OF INTEGRITY drums that may not meet the 4-ft drop test.*

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.2 Hazardous Material and Waste Management Program (cont.)

5.10.2.3 TRU WASTE CONTAINER Inspection

Safety Function: TRU WASTE CONTAINER inspections prevent flammable gas deflagrations and ensure that containers can mitigate other accidents involving containerized waste.

SAC: Incoming TRU WASTE CONTAINERS at WCRRF shall be visually inspected upon arrival (before the TRU WASTE CONTAINERS are placed in storage) to ensure that the TRU WASTE CONTAINERS meet the following minimum performance criteria:

1. VERIFY that the TRU WASTE CONTAINER is of non-combustible construction (top, bottom, and sides) and is of a design that has had a prototype meet the free-drop tests specified in 49 CFR 173.465(c)(1).
2. VERIFY that the TRU WASTE CONTAINER is integral and shows no signs of degradation by verifying the following:
   a. The TRU WASTE CONTAINER is not obviously DEGRADED.

      Discussion: Obviously DEGRADED means clearly visible and potentially significant defects in the TRU WASTE CONTAINER or TRU WASTE CONTAINER surface.
   b. There is no evidence that the TRU WASTE CONTAINER is, or has been, pressurized.

      Discussion: Pressurization can be indicated by a fairly uniform expansion of the sidewalls, bottom or top. Past pressurization can be indicated by a notable outward deflection of the bottom or top. VERIFY that the drum is not warped.

   c. There is no potentially significant rust or corrosion such that wall thinning, pinholes, or breaches are likely or the load bearing capacity is suspect.

      Discussion: Rust shall be assessed in terms of its type, extent, and location. Pitting, pocking, flaking, or dark coloration characterizes potentially significant rust or corrosion. This includes the extent of the TRU WASTE CONTAINER surface area, covered, thickness, and, if it occurs in large flakes or built-up (caked) areas. Rusted TRU WASTE CONTAINERS may not be accepted if:
      i. Rust is present in caked layers or deposits.
      ii. Rust is present in the form of deep metal flaking or built-up areas of corrosion products. In addition, the location of rust should be noted; for example, on a drum: top lid; filter region; locking chine; top one-third, above the second rolling hoop; middle one-third, between the first and second rolling hoops; bottom one-third, below the second rolling hoop; and on the bottom. TRU WASTE CONTAINERS may still be considered acceptable if the signs of rust show up as:
         1. Some discoloration on the TRU WASTE CONTAINER.
         2. If rubbed, rust would produce fine grit or dust or minor flaking (such that wall thinning does not occur).

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.2 Hazardous Material and Waste Management Program (cont.)

5.10.2.3 TRU WASTE CONTAINER Inspection (cont.)

d. There are no split seams, tears, obvious holes, punctures (of any size), creases, broken welds, or cracks.

Discussion: TRU WASTE CONTAINERS with obvious leaks, holes or openings, cracks, deep crevices, creases, tears, broken welds, sharp edges or pits, are either breached or on the verge of being breached.

e. The TRU WASTE CONTAINER is properly closed.

Discussion: Inspect the fastener and fastener ring (chine), if applicable, for damage or excessive corrosion. Check the alignment of the fastener to ensure that it is in firm contact around the entire lid and the TRU WASTE CONTAINER will not open during transportation.

f. There are no dents, scrapes, or scratches that make the TRU WASTE CONTAINER's structural integrity questionable or prevent the top and bottom surfaces from being parallel.

Discussion: Deep gouges, scratches, or abrasions over wide areas are not acceptable. If top and bottom surfaces are not parallel, this would indicate that the container is warped. Dents should be examined to determine impact of structural integrity.

g. There is no discoloration which would indicate leakage or other evidence of leakage of material from the TRU WASTE CONTAINER.

Discussion: Examine the TRU WASTE CONTAINER regions near vents, top lid fittings, bottom fittings, welds, seams, and intersections of one or more metal sheets or plates. TRU WASTE CONTAINERS must be rejected if evidence of leakage is present.

h. The TRU WASTE CONTAINER is not bulged.

Discussion: For the purposes of this examination, bulging is indicated by:

iii. A fairly uniform expansion of the sidewalls, bottom, or top (e.g., in the case of a drum, either the top or bottom surface protrudes beyond the planar surface of the top or bottom ring,

iv. A protrusion of the side wall (e.g., in the case of a drum, beyond a line connecting the peaks of the surrounding rolling hoops or a line between a surrounding rolling hoop and the bottom or top ring), or

v. Expansion of the sidewall (e.g., in the case of a drum, such that it deforms any portion of a rolling hoop).

3. VERIFY that the WASTE CONTAINER is equipped with WIPP-approved filtered vents, and the vents are free of obvious obstructions; and,
4. VERIFY receipt documentation indicating that
   a. the headspace gas concentration of a 55-gallon drum WASTE CONTAINER has been performed and is < 4% for hydrogen and < 8000 ppm for VOCs, and the 55-gallon drum WASTE CONTAINER is equipped with a WIPP-approved filtered vent, and the vent is free of obvious obstructions and
   b. each overpack above the 55-gallon drum, not the outermost overpack, must also have a WIPP-approved filter installed which is free of any obvious obstructions.

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.2 Hazardous Material and Waste Management Program (cont.)

5.10.2.3 TRU WASTE CONTAINER Inspection (cont.)

DEGRADED or LOSS OF INTEGRITY 55-gallon drums that have been overpacked into a protective container to ensure protection and containment of contents may be accepted if the outer most overpack container meets the inspection acceptance criteria for items 1 through 3, and the inner overpacks and associated 55-gallon drum has fulfilled inspection criteria 4.

Basis: *TRU WASTE CONTAINERS must meet the minimum performance requirements assumed in the accident analysis. Container integrity is ensured by confirming that the most outermost TRU WASTE CONTAINER is of the correct design (all metal construction; has had a prototype meet the 49CFR173.465(c)(1) free-drop test) and inspecting for secure lids, corrosion, damage, and leaks in order to correct DEGRADED drum conditions before an accident can occur.*

TRU waste is known to generate hydrogen, an extremely flammable and potentially explosive gas. Hydrogen is lighter than air, and, because of the small molecule size, is one of the most difficult gases to contain. The small molecule size also results in high buoyancy and diffusivity, so leaked hydrogen rises and dilutes quickly. The TRU waste may also contain volatile organic compounds (VOCs), which can evaporate and accumulate within the headspace of containers.

The presence of an adequately sized vent that is free of obstructions significantly minimizes the potential that hydrogen gas and flammable vapors will accumulate above flammable concentrations in the headspace of the 55-gallon drum which is to be bagged onto the WCG. Bulging of a drum is an indicator of INOPERABLE vents and gas generation/accumulation. Proper vent design and condition helps release the accumulated gases. Restricting the flammable gas concentrations to < 4% for hydrogen and < 8000 ppm for VOCs provides for an adequate margin of safety to ensure that the ignition of flammable gases is prevented.

Appendix B of the Department of Energy Standard 5506 Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities (DOE-STD-5506) cites the results of several empirical studies across the DOE complex, involving the pressurization of 55-gallon drums with high concentrations of hydrogen. A common theme of all of these studies is that hydrogen concentrations much greater than the LFL for hydrogen (4% by volume) are required to cause a drum to deflagrate and experience lid-loss.

Results of Idaho drum deflagration tests cited in the DOE-STD-5506, involving drums filled with simulated combustible and metal waste matrices and filled with hydrogen concentrations between 6-30%, indicate that regular drum handling of an unvented drum will not cause a deflagration. A spark plug used as a ~5 Joule ignition source applied to a 55-gallon drum with hydrogen concentrations of 30% was required to cause 4 of 12 test drums to experience lid loss. In the same tests, a ~20 milli-Joule ignition applied to a drum with 30% hydrogen also caused lid loss. Tests involving drums, also with hydrogen concentrations of 30% and exposed to a 12-foot drop or drill bit puncture perturbations, did not result in a lid loss of any indication of inner burning.

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.2 Hazardous Material and Waste Management Program (cont.)

5.10.2.3 TRU WASTE CONTAINER Inspection (cont.)

Other studies cited in DOE-STD-5506 include Savannah River Site (SRS) Drum Hydrogen Explosion Tests involving 18 test drums headspace hydrogen concentrations in the range of 13 to 36%. A hot wire was used as an ignition source. Five of the tests involving hydrogen concentrations ranging from 13.3 to 16.5 % experienced only bulging; four of the test drums with hydrogen concentrations in the range from approximately 17 to 35% experienced lid loss.

A conclusion of these studies was that an explosive mixture up to 15-volume% of hydrogen can be contained in a 55-gallon TRU drum without lid loss. In particular,

> *"the SRS experiments results show that "lid loss" occurred when exceeding ~ 17 vol%, and less than that caused the drum to bulge at the top and bottom, but with no loss of containment. This supports the 1983 Idaho conclusion that more than 14 vol% was needed for lid loss. The maximum pressures measured in the SRS experiment are also noteworthy regarding rapid depressurization that can cause ejection of some contents."*

DOE-STD-5506 Table 6.4.1-1, Hazard Controls, cites that for characterization and container handling of unvented drums,

> *"Until vented and hydrogen concentration is verified to be less than 8%, handle as suspect container." "Drums with hydrogen less than 8% concentration may still present some worker hazards. In particular, known hydrogen concentrations in the LFL range may warrant explicit Safety Management Program attributes on drum handling. All drums should be handled in accordance with industrial safety/hygiene and radiation protection controls invoked through SMPs."*

In comparison to the guidance in DOE-STD-5506, requiring verification of receipt documentation showing that the headspace gas concentration of hydrogen is less than 4% in a 55-gallon vented TRU waste container received at WCRRF, is conservative, since it is half of the hydrogen concentration cited in DOE-STD-5506 in the discussion on controls for deflagration accidents involving unvented drums, and less than one-third the value empirically determined to be required for a lid loss from an unvented drum to occur.

5.10.2.4 TRU WASTE CONTAINERS Staged in Transportainers

Safety Function: The requirement to stage TRU WASTE CONTAINERS inside secondary containment (transportainers) while in outdoor staging minimizes the release of TRU waste from external fires involving the TRU WASTE CONTAINERS.

SAC: TRU WASTE CONTAINERS shall be placed within the transportainers and container lids shall remain closed when staged outside the BUILDING TA-50-69 structure.

5.0 ADMINISTRATIVE CONTROLS

5.10 PROCESS/OPERATION-SPECIFIC ADMINISTRATIVE CONTROLS (cont.)

5.10.2 Hazardous Material and Waste Management Program (cont.)

5.10.2.4 TRU WASTE CONTAINERS Staged in Transportainers (cont.)

Basis: *The requirement to stage TRU WASTE CONTAINERS inside of secondary containment (i.e., transportainers) while in outdoor staging minimizes the release of TRU waste from grass wildland fires involving the TRU WASTE CONTAINERS. Secured TRU WASTE CONTAINER lids prevent spills and protect the TRU waste from accidents.*

5.10.2.5 Prohibit the storage, staging, and processing of INVENTORY within the GBE

Safety Function: Prohibiting the storage, staging, and processing of INVENTORY within the GBE preserves an initial condition assumption for the hazard analysis.

SAC: INVENTORY shall not be stored, staged, or processed within the confines of the GBE.

Basis: *No INVENTORY will be brought into the GBE for storage, staging, or processing. Prohibiting the storage, staging, and processing of INVENTORY within the GBE preserves an initial condition assumption for the hazard analysis, and limits the amount of radiological material that could be released in a GBE accident to the residual contamination that remains from past operations. The residual contamination within the GBE is assumed to be no greater than 10% of the Hazard Category 3 limit.*

5.10.3 Hoisting and Rigging Program

5.10.3.1 Critical Lift Plan

Safety Function: The use of a critical lift plan minimizes the probability of impacts and drops involving DEGRADED DRUMS or LOSS OF INTEGRITY drums.

SAC: A critical lift plan shall be implemented for lifts and forklift movements involving DEGRADED or LOSS OF INTEGRITY TRU drums when not secured in a TRU WASTE CONTAINER.

Basis: *The assurance that hoisting and rigging equipment is rated and certified for their loads, and operators and riggers are qualified to perform the lifts, significantly reduces the probability for drops of containers.*

6.0 DESIGN FEATURES

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6.0 DESIGN FEATURES

6.1 DESIGN FEATURES

According to 10 CFR 830.3, design features are the design features of a nuclear facility specified in the technical safety requirements that, if altered or modified, would have a significant effect on safe operation.

The purpose of this section is to describe the design features not covered elsewhere in the TSRs that could have a significant effect on safety if not maintained adequately or if modified without proper control. The following items are addressed in this section for each design feature:

1. Performance criteria;

2. The IN-SERVICE INSPECTION (ISI); and

3. The ISI interval.

The ISIs specified in this section will be implemented in accordance with the following:

1. Performance of ISIs shall be documented

2. If an ISI finds an item is in need of repair, maintenance or repair will be performed in accordance with Maintenance Program procedures

3. An IN-SERVICE INSPECTION shall be performed after any maintenance or modification of SC or SS design features.

4. Entry into a MODE or other specified condition in the applicability of a DF shall not be made unless the DF's IN-SERVICE INSPECTIONS have been met within their specified FREQUENCY.

The ISI is used to ENSURE compliance with the performance criteria, functional requirements, and safety functions identified for the SSC. The following generic issues are applicable to the ISI of DFs in this TSR:

1. FREQUENCY requirements for the ISI are identified for each DF (SSC).
2. A 25% extension of the interval specified in the FREQUENCY is allowed to facilitate ISI scheduling and considers facility operating conditions that may not be suitable for conducting the ISI (e.g., transient conditions of other on-going surveillance or maintenance activities). This extension is not intended to be used repeatedly as an operational convenience to extend ISI FREQUENCY intervals beyond those specified.
3. If an ISI determines that a DF does not meet its performance criteria, functional requirements, or safety function, that failure is new information which SHALL be evaluated for initiation of the PISA process.
4. ISIs do not have to be performed on DFs that are out of service or otherwise not required by the TSRs
5. DFs ISIs do not have to be performed during COLD STANDBY MODE.

6.0 DESIGN FEATURES

6.2 SAFETY-CLASS SSC DESIGN FEATURES

The following SSCs are identified by the accident analysis as safety-class:

- Vehicle Barriers
- TRU WASTE CONTAINERS

6.2.1 Vehicle Barriers

The performance criteria for vehicle barriers is as follows:

- The interconnected vehicle barriers (concrete Jersey barriers or equivalent or alternate design must be capable of stopping a vehicle gross weight of up to 72,000 lb (based on a tractor/trailer carrying transportainers and WASTE CONTAINERS) within 25 ft of the impact point moving at a velocity of up to 28 mph at a 25˚ impact angle or up to 9 mph at a 90˚ impact angle.
- The gate configuration of vehicle barriers must be capable of stopping a vehicle gross weight of up to 72,000 lb within 25 ft of the impact point moving at a velocity of up to 9 mph at a 90˚ impact angle.
- Gates may be removed for emergency vehicle access in an emergency, and the gates may be removed during TRU waste shipment activities when the delivery truck is positioned in front of the gate entrance.

Applicability: The Vehicle Barriers are required to meet the performance criteria when WCRRF is in OPERATION or WARM STANDBY MODE.

ISI actions and FREQUENCIES are as follows:

IN-SERVICE INSPECTION	FREQUENCY
The physical integrity of the vehicle barriers shall be inspected to identify any abnormalities that may develop, such as deterioration of concrete and degradation of wire rope and connectors, including corrosion and loose connections.	ANNUALLY
The physical placement of the vehicle barriers shall be inspected to ensure that their distance is at least 50 feet from TRU WASTE CONTAINER storage.	ANNUALLY

Basis

Vehicle barriers are designated as SC-SSCs based on their ability to provide protection to WASTE CONTAINERs staged inside BUILDING TA-50-69 or in outdoor transportainers against impacts by vehicles that could result in the release of the container contents. The vehicle barriers also prevent subsequent vehicle fuel pool fires from involving TRU waste by providing sufficient separation distance between pooled fuel and the WASTE CONTAINERS.

6.0 DESIGN FEATURES

6.2 SAFETY-CLASS SSC DESIGN FEATURES (cont.)

Properly positioned and connected vehicle barriers provide protection against motor vehicles inadvertently impacting TRU WASTE CONTAINERS at the WCRRF. Vehicle barriers are standard traffic control obstacles that absorb or redirect the momentum of errant vehicles to prevent impact with TRU WASTE CONTAINERS. The movable concrete barriers are interconnected and are positioned in strategic locations at WCRRF to prevent accidental vehicle impacts to TRU WASTE CONTAINERS that are staged

6.2.1 Vehicle Barriers (cont.)

in BUILDING TA-50-69 or in outdoor transportainers that could result in material releases. The vehicle barriers are also placed to provide a sufficient separation distance between any subsequent fuel pool fire and the TRU WASTE CONTAINERS. The interconnection of the barriers as part of the WCRRF's Vehicle Access System includes gated areas with removable connections. This TSR Design Feature ensures vehicle barrier design, integrity, and placement. Proper placement of the vehicle barriers is also ensured through the SAC for Vehicle Access System. Annual In-Service Inspections ensure the integrity of the barriers and interconnecting wire rope and hardware as well as the placement of the barriers. Fifty feet is the setback distance because the vehicle barriers may move up to 25 ft due to vehicle impact, and another 25 ft is required to protect TRU-waste containers from a 100-gallon diesel fuel spill and fire.

6.2.2 TRU WASTE CONTAINERS (Outside BUILDING TA-50-69)

The following is the performance and WCRRF acceptance criteria for TRU WASTE CONTAINERS when staged outside BUILDING TA-50-69:

- TRU WASTE CONTAINERS shall be of non-combustible construction (top, bottom, and sides).
- The TRU WASTE CONTAINERS shall be of a design that has had a prototype meet the free drop tests specified in 49 CFR 173.465(c)(1).
- TRU WASTE CONTAINERS shall have WIPP-approved filtered vents to prevent buildup of flammable gases inside the container.

Only TRU WASTE CONTAINERs meeting the performance requirements are accepted for receipt into the WCRRF for processing. Receipt inspection is covered by SAC 5.10.2.3. Because of the short residence time of TRU WASTE CONTAINERs at WCRRF and the detailed receipt inspection in SAC 5.10.2.3, no additional ISI is required for the TRU WASTE CONTAINER Design Feature.

Basis

The TRU WASTE CONTAINERS are credited as safety-class components to protect the INVENTORY from accidents in the WCRRF yard area only. Once the TRU WASTE CONTAINERS are brought into BUILDING TA-50-69, their safety function is considered safety-significant based on the lower INVENTORY limits inside BUILDING TA-50-69. The TRU WASTE CONTAINERS in the WCRRF yard area protect the INVENTORY from seismic events, fires, deflagrations, and drop scenarios. The non-combustible construction minimizes the release of INVENTORY from potential fires in the transportainers. Tests have shown that fires involving ordinary combustibles can, at most, overpressurize the TRU WASTE CONTAINERS, leading to a breach of drum lids and a minor release of contamination. Fires involving liquid fuel can overpressurize drums so fast that the drums' lids and a portion of the drums' contents can be expelled. For this reason, other controls in the TSRs prohibit liquid fuel in the

6.0 DESIGN FEATURES

WCRRF while TRU WASTE CONTAINERS are present. The TRU WASTE CONTAINERS are also of a design that has been tested in four-foot free-drop tests. This qualification protects the INVENTORY from seismic impacts and drop events during handling. The vents on the drums allow any flammable gas generated by the TRU waste to safely vent out of the TRU WASTE CONTAINER. This prevents the possibility of a drum deflagration or explosion during handling due to the buildup of flammable gas concentrations in the TRU WASTE CONTAINER. Because of the detailed receipt inspection of the TRU WASTE CONTAINERS before acceptance at WCRRF, no additional ISI is required.

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6.3 SAFETY-SIGNIFICANT SSC DESIGN FEATURES (DF)

The safety function of these SSCs contributes to the prevention or mitigation of the evaluation-basis accidents evaluated in the accident analysis, provides critical DEFENSE-IN-DEPTH, or provides for worker safety in potentially life-threatening situations:

- BUILDING TA-50-69 structural integrity
- BUILDING TA-50-69 confinement ventilation system
- Waste characterization glovebox design/integrity
- Transportainer structural design/integrity
- TRU WASTE CONTAINERS inside BUILDING TA-50-69

For all of these DFs, the performance criteria identified in Chapter 4 must be maintained and protected through change control and inspection are listed below.

6.3.1 BUILDING TA-50-69 Structural Integrity

The performance criteria for BUILDING TA-50-69 that are not addressed in TSR Section 3/4.3 are as follows:

The BUILDING TA-50-69 structure meets PC-2 seismic criteria.

The BUILDING TA-50-69 structure is designed to meet PC-2 wind and snow loading requirements.

The interior walls of BUILDING TA-50-69 must be constructed of non-combustible materials that provide a confinement barrier in conjunction with the confinement ventilation system.

Applicability: The BUILDING TA-50-69 structure is required to meet the performance criteria when WCRRF is in OPERATION or WARM STANDBY MODE.

ISI actions and FREQUENCIES are as follows:

IN-SERVICE INSPECTION	FREQUENCY
Visually inspect BUILDING TA-50-69 to VERIFY that the building structure has not deteriorated and has not been modified, penetrated, or otherwise altered in such a manner as to compromise the structural strength and confinement capability.	ANNUALLY

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6.3 SAFETY SIGNIFICANT SSC DESIGN FEATURES (cont.)

6.3.1 BUILDING TA-50-69 Structural Integrity (cont.)

Basis

BUILDING TA-50-69 provides a confinement barrier for potential releases inside the building. To provide this confinement barrier, BUILDING TA-50-69 must meet PC-2 design requirements for seismic events, high winds, and snow loading. The BUILDING TA-50-69 structure has been analyzed to demonstrate that it meets all of these requirements. The ISI is performed annually to ensure that no degradation has occurred that would invalidate the assumptions in the analyses.

6.3.2 The WCRRF BUILDING TA-50-69 Confinement Ventilation System

The performance criteria for BUILDING TA-50-69 that are not addressed in TSR Section 3/4.3 are as follows:

- The FE-001, FE-002, and FE-003 HEPA filters are rated for a 12-hr continuous service at 250 °F.
- HEPA filter plenum and ductwork must provide a functional confinement barrier in conjunction with the exhaust ventilation system.

Applicability: The WCRRF BUILDING TA-50-69 Confinement Ventilation System is required to meet the performance criteria when WCRRF is in OPERATION or WARM STANDBY MODE.

ISI actions and FREQUENCIES are as follows:

IN-SERVICE INSPECTION	FREQUENCY
Visually inspect the BUILDING TA-50-69 and WCG/GBE air exhaust ductwork for degradation or unauthorized modifications.	ANNUALLY

Basis

The exhaust HEPA filters in FE-001, FE-002, and FE-003 must be rated for 12 hrs of continuous service at 250 °F. This requirement is based on a fire in the WCG that creates temperatures of approximately 3,000 °F. The exhaust air from the WCG is mixed with exhaust from the GBE at about a 9:1 ratio so that the combustion gases are cooled below 250 °F before they reach the HEPA filter plenum. This ensures that a fire in the WCG will not challenge the HEPA filters. A time of 12 hours was selected as a conservative time to extinguish the fire. The HEPA filters on FE-001 and FE-002 are protected by the fire suppression system, which will actuate and cool combustion gases in BUILDING TA-50-69 before being drawn into the FE-001 and FE-002 exhaust streams so that these filters are not challenged. This performance criterion is applicable for procurement of new filters, and no ISI is required.

6.0 DESIGN FEATURES

6.3 SAFETY SIGNIFICANT SSC DESIGN FEATURES (cont.)

6.3.2 The WCRRF BUILDING TA-50-69 Confinement Ventilation System (cont.)

The HEPA plenum and ductwork are a confinement barrier for potential releases inside the building. To provide this confinement barrier, the HEPA plenum and ductwork must remain intact during normal operations and seismic, wind, and fire events. The HEPA plenums and ductwork are constructed of steel and stainless steel. With the protection of the fire suppression system, the structural integrity of the HEPA plenum and ductwork will not be challenged. The HEPA plenum and ductwork have not been evaluated for seismic or wind, which is an identified vulnerability in the BIO. The ISI is performed annually to ensure that no degradation has occurred that would diminish the capability of the HEPA plenum or ductwork to perform its safety function. For FE-001, the inspection will include the HEPA plenum and up to and including the exhaust fan housing. For FE-002, the inspection will include the ductwork from building TA-50-69 up to and including the HEPA plenum. For FE-003, the inspection will include the ductwork from the WCG/GBE up to and including the exhaust fan housing.

6.3.3 Waste Characterization Glovebox

The performance criteria for the WCG is as follows:

The WCG shall provide primary confinement for waste material operations and minimize releases to the main process area during normal operation, loss of ventilation, and following a PC-2 seismic event.

Applicability: The WCRRF BUILDING TA-50-69 Confinement Ventilation System is required to meet the performance criteria when WCRRF is in OPERATION or WARM STANDBY MODE.

ISI actions and FREQUENCIES are as follows:

IN-SERVICE INSPECTION	FREQUENCY
Visually inspect the WCG for structural and confinement deterioration.	ANNUALLY

Basis

The WCG serves as a primary confinement barrier to prevent releases from TRU waste during drum repackaging. In conjunction with the WCG ventilation system, the WCG is effective at protecting workers and the public from potential contamination releases. The WCG has been evaluated to withstand PC-2 seismic events. The ISI is performed annually to ensure that no degradation has occurred that would invalidate the assumptions in the analyses.

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6.3.4 Deleted

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6.3 SAFETY SIGNIFICANT SSC DESIGN FEATURES (cont.)

6.3.5 Deleted

6.3.6 TRU WASTE CONTAINER (Inside BUILDING TA-50-69)

The performance criteria for the TRU WASTE CONTAINER are as follows:

- The TRU-WASTE CONTAINER shall be of noncombustible construction (top, bottom, and sides), excluding any protective covering applied to the drum.
- DEGRADED and LOSS OF INTEGRITY drums shall be wrapped with a protective covering as a conservative measure.
- The TRU-WASTE CONTAINER shall be of a design whose prototype met the free-drop tests specified in 49 CFR 173.465(c)(1), Type A Packaging Tests.
- TRU-WASTE CONTAINERs shall have a WIPP-approved filtered vent large enough to prevent buildup of flammable gases in the container.

ISI actions and FREQUENCIES are as follows:

IN-SERVICE INSPECTION	FREQUENCY
Ensure that a known DEGRADED DRUM or TRU WASTE CONTAINER exhibiting signs of LOSS OF INTEGRITY is wrapped in protective covering.	After removing TRU WASTE CONTAINER from overpack.

6.0 DESIGN FEATURES

6.3 SAFETY SIGNIFICANT SSC DESIGN FEATURES (cont.)

6.3.6 TRU WASTE CONTAINER (Inside BUILDING TA-50-69) (cont.)

Basis

The TRU WASTE CONTAINERS are credited as safety-class components to protect the INVENTORY from accidents in the WCRRF yard area only. Once the TRU WASTE CONTAINERS are brought into BUILDING TA-50-69, their safety function is considered safety-significant based on the lower INVENTORY limits and associated accident consequences inside BUILDING TA-50-69. Some drums that require repackaging in BUILDING TA-50-69 may be DEGRADED or exhibit loss of confinement. These drums will be overpacked in safety-class TRU WASTE CONTAINERS before being accepted at WCRRF. Once these drums are moved into BUILDING TA-50-69, they will be removed from the overpack containers. After inner drums are removed from their overpacking, the drums must be inspected. Any DEGRADED DRUM or LOSS OF INTEGRITY drum must be wrapped in protective covering for contamination control. If the protective covering is damaged, the protective covering must be repaired.

The TRU WASTE CONTAINERS in BUILDING TA-50-69 protect the INVENTORY from seismic events, fires, deflagrations, and drop scenarios. The non-combustible (excluding any protective covering applied to the drum) construction minimizes the release of INVENTORY from potential fires in BUILDING TA-50-69. Tests have shown that fires involving ordinary combustibles can, at most, overpressurize the TRU WASTE CONTAINERS, leading to a breach of drum lids and a minor release of contamination. Fires involving liquid fuel can overpressurize drums so fast that the drums' lids and a portion of the drums' contents can be expelled. For this reason, other controls in the TSRs prohibit liquid fuel in the WCRRF while TRU WASTE CONTAINERS are present. The TRU WASTE CONTAINERS are also of a design that has been tested in four-foot free-drop tests. This qualification protects the INVENTORY from seismic impacts and drop events during handling. DEGRADED DRUMs or LOSS OF INTEGRITY drums may not meet this qualification, and additional controls are put in place through critical lift plans and the safety-significant drum lift on the WCG to prevent and mitigate the consequences of handling accidents with these drums. The vents on the drums allow any flammable gas generated by the TRU waste to safely vent out of the TRU WASTE CONTAINER. This prevents the possibility of a drum deflagration or explosion during handling due to the buildup of flammable gas concentrations in the TRU WASTE CONTAINER. Verification of the filtered vent opening and the TRU WASTE CONTAINER is covered under SAC 5.10.2.3 and no further ISI is required. If an inner drum is removed from an overpack, it must be inspected and if it is a DEGRADED DRUM or exhibits LOSS OF INTEGRITY, it must be wrapped in protective covering.

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APPENDIX A – BASES

A2.1 SAFETY LIMITS

SAFETY LIMITS (SLs), as defined in 10 CFR 830 and Section 1.1 of this document, are limits on important process variables needed for the facility function that, if exceeded, could directly cause the failure of one or more of the passive barriers that prevent the uncontrolled release of INVENTORY, with potential consequences to the public above the specified evaluation guideline.

Based on the above criteria and methodology, no SLs are identified for the WCRRF.

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A3/4.0 GENERAL LIMITING CONDITIONS FOR OPERATION

BACKGROUND SUMMARY

LCOs 3.0.1 through 3.0.6 establish the general requirements applicable to all LCOs at all times, unless otherwise stated. The general requirements contained in LCOs 3.0.1-3.0.6 provide overall rules to guide the use and application of the specific requirements of the LCOs in Section 3.0 of the TSRs. When exceptions to the general requirements contained in LCOs 3.0.1-3.0.6 are allowed, they are stated as notes in the individual LCO.

NOTE

General LCOs are based on DOE G 423.1-1, *Implementation Guide for Use in Developing Technical Safety Requirements*, October 2003. The deviations from the guide are changes necessary to fit the WCRRF, such as the phrases *facility* and *process area* were changed to *applicable area* to allow different operations areas or to prevent potential logic inconsistencies. The term STANDBY was changed to WARM STANDBY to be consistent with the defined MODES for the WCRRF. In addition to the above wording changes, some terms were capitalized to indicate that they are defined terms in the WCRRF TSR.

A3.0.1

LCO 3.0.1 establishes the MODE Applicability statements within each LCO as the requirement for conformance to the LCO for safe operation of the applicable areas. This statement indicates that the LCO is only required to be met when the conditions of the Applicability statement are met. However, if the Applicability statement is met, the LCO must also be met. The ACTION(s) establish the remedial measures that must be taken within specified COMPLETION TIME(s) when requirements of a LCOs are not met as required by LCO 3.0.2.

A3.0.2

LCO 3.0.2 establishes that, on discovery of a failure to meet an LCO, the associated ACTION(s) shall be met within the specified COMPLETION TIME. The COMPLETION TIME of each ACTION is applicable from the time that a condition is entered. The ACTION(s) establish those remedial measures that shall be taken within specified COMPLETION TIME(s) when the requirements of an LCO are not met.

This LCO establishes that

1. Completion of the ACTION(s) within the specified COMPLETION TIME(s) constitutes compliance with an LCO.
2. Completion of the ACTION(s) is not required when an LCO is met within the specified COMPLETION TIME, unless otherwise stated.

There are two basic types of ACTION(s). The first type of ACTION specifies a time limit in which the LCO shall be met or additional ACTION is needed. This time limit is the COMPLETION TIME to restore an INOPERABLE system or component to OPERABLE status or to restore variables to within specified limits. If this type of ACTION is not completed within the specified COMPLETION TIME, a shutdown may be required to place the applicable area

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A3/4.0 GENERAL LIMITING CONDITIONS FOR OPERATION

in a MODE or condition in which the LCO is not applicable. (Whether stated as an ACTION or not, the restoration of INOPERABLE equipment or a condition back to within limit is an ACTION that may always be considered on entering LCO ACTION(s).)

Some LCO ACTION(s) specify a COMPLETION TIME to initiate an ACTION to place the applicable areas in a specified MODE or other safe condition. This wording allows operations personnel a reasonable amount of time to determine what actions are necessary, to determine the correct course of action to safely perform the necessary ACTION(s), and to perform any necessary administrative functions associated with the ACTION(s). When COMPLETION TIME(s) were not specified for completion of the applicable area reconfiguration or MODE change in order to allow reasonable operational flexibility, the intent is not to delay placing the applicable area in a safe condition or MODE. Necessary ACTION(s) should be completed in a minimum time frame and should not be extended for operational convenience.

The second type of ACTION specifies remedial measures that permit continued operation of the applicable area not further restricted by the COMPLETION TIME. In this case, conformance to the ACTION(s) provides an acceptable level of safety for continued operation.

Completion of ACTION(s) is not required when an LCO is met or is no longer applicable within the associated COMPLETION TIME(s), unless otherwise stated in the individual LCO.

The nature of some ACTION(s) for some condition(s) necessitates that, once the condition is entered, ACTION(s) shall be completed even though the associated condition(s) are resolved. The ACTION(s) of the individual LCOs specify where this is the case.

The COMPLETION TIME(s) of the ACTION(s) are also applicable when a system or component is intentionally taken out of service. The reasons for intentionally relying on the ACTION(s) include, but are not limited to, the performance of SURVEILLANCE REQUIREMENTS, preventative maintenance, corrective maintenance, or the investigation of operational problems. ACTION(s) for these reasons shall be performed in a manner that does not compromise safety. It is not intended that ACTION(s) be intentionally entered for operational convenience. This requirement is to limit routine, voluntary removal of redundant or standby equipment from service in lieu of other alternatives that would not result in redundant or standby equipment being INOPERABLE. This limits the time that subsystems or trains of a safety system are INOPERABLE. It also limits the time that other condition(s) exist that result in LCO 3.0.3 being entered. Individual LCOs may specify a time limit for performing a SURVEILLANCE REQUIREMENT when equipment is taken out of service or bypassed for testing. In this case, the COMPLETION TIME(s) of the ACTION(s) are applicable when this time limit expires, if the SURVEILLANCE REQUIREMENT has not been completed.

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A3/4.0 GENERAL LIMITING CONDITIONS FOR OPERATION

When a change in a MODE or other specified condition is required to comply with ACTION(s), the applicable area may enter a MODE or other specified condition in which a new LCO becomes applicable. In this case, the COMPLETION TIME(s) of the associated ACTION(s) would apply from the time that the new LCO becomes applicable, and any condition(s) is entered.

A3.0.3 LCO 3.0.3 establishes the ACTION(s) that must be implemented when an LCO is not met and when one of the following Conditions occurs:

1. An associated Required ACTION is not met in the specified Completion Time, and no other Condition applies, or

2. The Condition is not specifically addressed by the associated Required ACTION(s).

This LCO requires that the affected area(s) be placed in a MODE where the LCO does not apply if the limits for operation, as defined by the LCO and its ACTION(s) Section, cannot be met or associated ACTION(s) are not provided. This ACTION shall be initiated within 1 hour and completed within the next 12 Hours. One hour provides sufficient time for a safety-based review of the situation prior to initiating MODE change evolutions; 12 hours is sufficient to complete the MODE change in a safe and orderly manner.

However, it is recognized that some LCOs apply in OPERATIONS and WARM STANDBY MODES. When this condition exists and LCO 3.0.3 is required to be entered, steps shall be initiated within 1 Hour to stop all repackaging activities and to place any affected area(s) which is in OPERATION to COLD STANDBY. This ACTION shall isolate the affected area(s) and place it in the safest condition possible.

A3.0.4 LCO 3.0.4 establishes the limitations on changes in MODES or other specified conditions in the Applicability statement when an LCO is not met. It precludes placing the applicable area in a different MODE or other specified condition when the following exists:

1. The requirements of an LCO in the MODE or other specified condition to be entered are not met.
2. Continued noncompliance with these requirements would result in requiring that the applicable area be placed in a MODE or other specified condition in which the LCO does not apply to comply with the ACTION(s).

Compliance with ACTION(s) that permit continued operation of the applicable area for an unlimited period of time in an applicable MODE or other specified condition provides an adequate level of safety for continued operation, without regard for the status of the applicable area before or after the MODE change. Therefore, in such cases, entry into a MODE or other condition in the Applicability statement may be made in accordance with the provisions of the ACTION(s). The provisions of this LCO shall not be interpreted as endorsing the

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A3/4.0 GENERAL LIMITING CONDITIONS FOR OPERATION

failure to exercise the good practice of restoring systems or components to OPERABLE status before changing MODES.

The provisions of LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability statement that are required to comply with ACTION(s).

Exceptions to LCO 3.0.4 are stated in the individual LCOs. Exceptions may apply to all the ACTION(s) or to a specific ACTION of an LCO.

When changing MODES or other specified operating configurations while in a condition (in compliance with LCO 3.0.4 or where an exception to LCO 3.0.4 is stated), the ACTION(s) define the remedial measures that apply.

SURVEILLANCE REQUIREMENTS do not have to be performed on the associated INOPERABLE equipment (or on variables outside the specified limits), as permitted by SR 4.0.1. Therefore, a change in MODE or other specified operating configuration in this situation does not violate SR 4.0.1 or SR 4.0.4 for those SURVEILLANCE REQUIREMENTS that do not have to be performed because of the associated INOPERABLE equipment. However, SURVEILLANCE REQUIREMENTS shall be met to demonstrate OPERABILITY before declaring the associated equipment OPERABLE (or variable within limits) and restoring compliance with the affected LCO.

A3.0.5 LCO 3.0.5 establishes the allowance of restoring equipment to service under administrative/procedural controls when it has been removed from service or declared INOPERABLE to comply with ACTION(s). The sole purpose of this LCO is to provide an exception to LCO 3.0.2 to allow the performance of SURVEILLANCE REQUIREMENTS to demonstrate the following:

1. OPERABILITY of the equipment being returned to service, or
2. OPERABILITY of other associated equipment.

ADMINISTRATIVE CONTROLS are to ensure that the time the equipment is returned to service in conflict with the requirements of the ACTION(s) is limited to the time absolutely necessary to perform the allowed SURVEILLANCE REQUIREMENT. This LCO does not provide time to perform any other preventive or corrective maintenance.

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A3/4.0 GENERAL LIMITING CONDITIONS FOR OPERATION

A3.0.6 LCO 3.0.6 establishes an exception to LCO 3.0.2 for support systems that have an LCO or ACTION statement specified in the TSR. This exception is necessary because LCO 3.0.2 would require that the condition(s) and ACTION(s) of the associated INOPERABLE supported system LCO be entered solely from the inoperability of the support system. This exception is justified because the ACTION(s) that are required to ensure that the applicable area is maintained in a safe operating configuration are specified in the support system ACTION(s). These ACTION(s) may include entering the supported system's condition(s) and ACTION(s) or may specify other ACTION(s).

When a support system is INOPERABLE and there is an LCO specified for it in the TSRs, the supported system(s) is not required to be declared INOPERABLE as a result of the support system's INOPERABILITY. However, it is not necessary to enter into the supported system's condition(s) and ACTION(s) unless directed to do so by the support system's ACTION(s). The confusion and inconsistency of interpretation of requirements related to the entry into multiple condition(s) and ACTION(s) shall be eliminated by providing all the ACTION(s) that are necessary to ensure that the facility is maintained in a safe condition in the support system's ACTION(s).

When a support system is INOPERABLE and there is no LCO specified for it, the impact of the degradation of the support system function on the OPERABILITY of its supported systems shall be evaluated. The degradation of the support system may or may not affect the OPERABILITY of the supported systems. OPERABILITY of the supported system shall depend on the intended function of the supported system and the level of support that the supported system provides. Unless otherwise justified (on determination that the supported system is INOPERABLE), the condition(s) and ACTION(s) of the supported system's LCO shall apply or other compensatory ACTION(s) or requirements shall apply, as otherwise justified.

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A3/4.0 GENERAL SURVEILLANCE REQUIREMENTS

BACKGROUND SUMMARY

SRs 4.0.1 through 4.0.4 establish the general requirements applicable to all SURVEILLANCE REQUIREMENTS and apply at all times, unless otherwise stated. The general requirements contained in SRs 4.0.1-4.0.4 provide overall rules to guide the use and application of the specific requirements of the SRs in Section 4.0 of the TSRs. When exceptions to the general requirements contained in SRs 4.0.1-4.0.4 are allowed, they are stated as notes in the individual SR.

NOTE

General LCOs are based on DOE G 423.1-1, *Implementation Guide for Use in Developing Technical Safety Requirements,* October 2003 and DOE *Document of Example Technical Safety Requirements, Volume 1, Examples*, November 1993. The deviations from the Guide are changes necessary to fit the WCRRF, such as the phrases *facility* and *process area* were changed to *applicable area* to allow different operations areas or to prevent potential logic inconsistencies. In addition, some terms were capitalized to indicate that they are defined terms in this TSR.

A4.0.1

SR 4.0.1 establishes the requirement that SURVEILLANCE REQUIREMENTS must be met during the MODES or other specified conditions in the Applicability statements for individual LCOs unless otherwise stated in the individual SURVEILLANCE REQUIREMENTS. This SR ensures that surveillances are performed to VERIFY the OPERABILITY of systems and components and that variables are within specified limits. Failure to meet a SURVEILLANCE REQUIREMENT within the specified FREQUENCY, in accordance with SR 4.0.2, constitutes a failure to meet an LCO.

Systems and components are assumed to be OPERABLE when the associated SURVEILLANCE REQUIREMENTS have been met. Nothing in this SR, however, is to be construed as implying that systems or components are OPERABLE when

1. The systems or components are known to be INOPERABLE, although still meeting the SRs; or

2. The requirements of the surveillance(s) are known not to be met between required surveillance performances.

Surveillances do not have to be performed when the applicable area is in a MODE or other specified condition for which the requirements of the associated LCO are not applicable, unless otherwise specified.

Surveillances, including surveillances invoked by ACTION(s), do not have to be performed on INOPERABLE equipment. The sole purpose of a surveillance is to determine OPERABILITY. If the equipment has been declared INOPERABLE and/or out of service, an OPERABILITY determination has already been made.

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A3/4.0 GENERAL SURVEILLANCE REQUIREMENTS

ACTION(s) caused by the equipment INOPERABILITY define the remedial measures that apply. SURVEILLANCE REQUIREMENTS have to be met in accordance with SR 4.0.2 before returning equipment to OPERABLE status.

Measurement devices used to demonstrate compliance with LCO SRs must be calibrated to plant design, manufacturer's specifications, and/or industry standards as described in the WCRRF Calibration Program, if applicable.

SURVEILLANCE REQUIREMENT results must be documented in an auditable and traceable manner.

Upon completion of maintenance, appropriate post-maintenance testing is required to declare equipment OPERABLE. This declaration includes meeting applicable SURVEILLANCE REQUIREMENTS in accordance with SR 4.0.2. Post-maintenance testing may not be possible in the current MODE or specified operating configuration in the Applicability because the necessary facility parameters were not established. In these situations, the equipment may be considered OPERABLE, provided that testing has been satisfactorily completed to the extent possible and that the equipment is not otherwise believed to be incapable of performing its function. This shall allow operation to proceed to a MODE or other specified operating configuration where other necessary post-maintenance tests can be completed.

A SURVEILLANCE REQUIREMENT that requires removal of equipment from service does not constitute a failure to meet an LCO. Individual surveillance procedures must describe appropriate limitations beyond which an out-of-tolerance condition would exist.

A4.0.2

SR 4.0.2 establishes the requirements for meeting the specified FREQUENCY for surveillances. Surveillance frequencies should be based on historical data, engineering or manufacturer's information, or safety analysis to allow the longest reasonable time period between surveillances to ensure OPERABILITY. Failure to perform the SURVEILLANCE REQUIREMENTS within the specified frequencies may result in operation beyond the assumptions specified in the SAFETY BASIS.

SR 4.0.2 permits a 25% extension of the interval specified in the SURVEILLANCE REQUIREMENTS FREQUENCY. This SR is designed to facilitate SURVEILLANCE REQUIREMENT scheduling in conditions where performance would represent an operational hardship or cause an unsafe transient. It allows the consideration of facility operating conditions that may not be suitable for conducting the SURVEILLANCE REQUIREMENT (e.g., transient states or other ongoing surveillance or maintenance activities).

The 25% extension does not significantly degrade the reliability that results from performing the SURVEILLANCE REQUIREMENT at its specified FREQUENCY. This conclusion is based on the recognition that the most

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A3/4.0 GENERAL SURVEILLANCE REQUIREMENTS

probable result of any particular SURVEILLANCE REQUIREMENT being performed is the VERIFICATION of conformance with the SURVEILLANCE REQUIREMENTS. The exceptions to SR 4.0.2 are those SURVEILLANCE REQUIREMENTS for which the 25% extension of the interval specified in the FREQUENCY does not apply. These exceptions are stated in the individual SURVEILLANCE REQUIREMENTS. An example of where SR 4.0.2 does not apply is a SURVEILLANCE REQUIREMENT with a FREQUENCY of "in accordance with another DOE regulation." The requirements of regulations take precedence over the TSRs. The TSRs cannot, in and of themselves, extend a test interval specified in the regulations. Therefore, there would be a note: in the FREQUENCY that states, "SR 4.0.2 is not applicable."

The provisions of SR 4.0.2 are not intended to be used repeatedly merely as an operational convenience to extend SURVEILLANCE REQUIREMENT intervals or periodic COMPLETION TIME intervals beyond those specified.

A4.0.3 SR 4.0.3 establishes the flexibility to defer declaring affected equipment INOPERABLE or an affected variable outside the specified limits when a surveillance has not been completed within the specified FREQUENCY. A delay period of up to 24 hours applies from the time it is discovered that the surveillance has not been performed, in accordance with SR 4.0.2, and not at the time the specified FREQUENCY was not met.

To avoid subjecting the facility to unnecessary transients, upon discovery of a missed surveillance, 24 hours or the time limit of the specified surveillance FREQUENCY, whichever is less, is allowed to complete the surveillance before taking the required ACTION of the LCO. This delay period provides an adequate time limit to complete missed surveillances. This delay period permits the completion of a surveillance before compliance with ACTION(s) or other remedial measures would be required that may preclude completion of the surveillance. The basis for this delay period includes consideration of facility operating configuration, adequate planning, availability of personnel, the time required to perform the surveillance, the safety significance of the delay in completing the required surveillance, and the recognition that the most probable result of any particular surveillance being performed is the VERIFICATION of conformance with the SURVEILLANCE REQUIREMENTS. When a surveillance with a FREQUENCY, based not on time intervals but on specified conditions or operational situations, is discovered not to have been performed when specified, SR 4.0.3 allows the full 24-hour delay period in which to perform the surveillance.

The provisions of SR 4.0.3 also provide a time limit for completion of surveillances that become applicable as a consequence of changes imposed by ACTION(s).

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A3/4.0 GENERAL SURVEILLANCE REQUIREMENTS

Failure to comply with specified FREQUENCIES for SURVEILLANCE REQUIREMENTS is expected to be an infrequent occurrence. Use of the delay period established by SR 4.0.3 is a flexibility that is not intended to be used as an operational convenience to extend surveillance intervals. This extension also does not preclude notification of a VIOLATION of SR 4.0.2.

If a SURVEILLANCE REQUIREMENT is not completed within the allowed delay period, the equipment is considered INOPERABLE or the variable is considered outside the specified limits, and the COMPLETION TIME(s) of the ACTION(s) for the applicable LCO condition(s) begin IMMEDIATELY upon expiration of the delay period. If a SURVEILLANCE REQUIREMENT is failed within the delay period, then the equipment is INOPERABLE, or the variable is outside the specified limits and the COMPLETION TIME(s) of the ACTION(s) for the applicable LCO CONDITION(s) begin IMMEDIATELY upon the failure of the SURVEILLANCE REQUIREMENT.

Completion of the SURVEILLANCE REQUIREMENT within the delay period allowed by this LCO, or within the COMPLETION TIME(s) of the ACTION(s), restores compliance with SR 4.0.1.

A4.0.4 SR 4.0.4 establishes the requirement that all applicable SURVEILLANCE REQUIREMENTS must be met before entry into a MODE or other specified operating configuration in the Applicability statements.

This SURVEILLANCE REQUIREMENT ensures that system and component OPERABILITY requirements and variable limits are met before entry into a MODE or other specified operating configuration in the Applicability statements for which these systems and components ensure safe operation of the facility. This SURVEILLANCE REQUIREMENT applies to changes in MODES or other specified operating configurations in the Applicability statements associated with the facility.

The provisions of SR 4.0.4 shall not prevent changes in MODES or other specified operating configurations in the Applicability statements that are required to comply with the ACTION(s).

The precise requirements for performance of SURVEILLANCE REQUIREMENTS are specified so that exceptions to SR 4.0.4 are not necessary. The specific time frames and conditions necessary for meeting the SURVEILLANCE REQUIREMENTS in accordance with the requirements of SR 4.0.4 are specified in the FREQUENCY, in the SURVEILLANCE REQUIREMENT, or both. This allows performance of SURVEILLANCE REQUIREMENTS when the prerequisite conditions specified in a SURVEILLANCE REQUIREMENT procedure require entry into the MODE or other specified operating configuration in the Applicability statements of the associated LCO before the performance or completion of a SURVEILLANCE REQUIREMENT. A SURVEILLANCE REQUIREMENT that could not be

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A3/4.0 GENERAL SURVEILLANCE REQUIREMENTS

performed until after entering the LCO Applicability statements would have its FREQUENCY specified so that it is not "due" until the specific operating configuration needed is met. Alternately, the SURVEILLANCE REQUIREMENT may be stated in the form of a Note as "not required" (to be met or performed) until a particular event, operating configuration, or time has been reached.

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A3/4.1 INVENTORY LIMITS

BACKGROUND SUMMARY

The INVENTORY limits restrict the quantity of RADIOACTIVE MATERIAL that may be present at the WCRRF as well as in BUILDING TA-50-69 during the specified MODEs. INVENTORY is present at WCRRF in TRU WASTE CONTAINERS. TRU WASTE CONTAINERS are always closed unless primary confinement is provided by the WCG. The BUILDING TA-50-69 INVENTORY is expressed in terms of EQUIVALENT COMBUSTIBLE WASTE. The total site INVENTORY is expressed in terms of plutonium-equivalent curies (PE-Ci). EQUIVALENT COMBUSTIBLE WASTE determinations are shown in SBDO: CALC 07-026, *Source Term and Consequence Analysis for Combustible (Plutonium-239) Equivalency for Environmental Management Waste Forms.*

The WCRRF handles three basic types of contaminated waste material. These are non-combustible solids, combustible solids, and filter media. Rather than establish and track INVENTORY limits for each type of contaminated waste material inside BUILDING TA-50-69, a conversion factor was developed that equated the BUILDING TA-50-69 INVENTORY of the different types of material to combustible material type, hence the unit "EQUIVALENT COMBUSTIBLE WASTE."

The INVENTORY limit for the WCRRF of 1800 PE-Ci does not consider the waste matrix. As TRU WASTE CONTAINERS are brought into BUILDING TA-50-69, the conversion factor is applied.

APPLICATION TO SAFETY ANALYSIS

The WCRRF INVENTORY control limit was used in the hazard and accident analyses as the quantity of material at risk (MAR) for postulated accidents during routine operations. The offsite consequence calculations (dose) in the BIO accident analysis were based on the INVENTORY limits. All INVENTORY is converted to PE-Ci using the method contained in Appendix B of the Waste Isolation Pilot Plant waste acceptance criteria (see References).

To evaluate RADIOACTIVE MATERIAL holdup in the WCG, GBE, and associated ductwork, smear data was obtained from recent radiological surveys. The highest smear data sample was used as the average loading on the entire surface area inside the WCG, GBE, and associated ductwork. The RADIOACTIVE MATERIAL holdup calculated in this manner was approximately one-tenth of the HC-3 threshold (0.52 PE-Ci). This demonstrates that RADIOACTIVE MATERIAL holdup is negligible and can be excluded from tracking against the facility INVENTORY limits.

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A3/4.1 INVENTORY Limits (cont.)

LCO

INVENTORY shall meet the following limits:

LCO 3.1 Condition Statement #1 – BUILDING TA-50-69 $\leq$ 800 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE.

The INVENTORY limit of 800 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE was chosen based on the INVENTORY of WASTE CONTAINERs > 56 PE-Ci with mainly combustible material, and the operational need to characterize and repackage several high-activity containers of waste in preparation for their transfer to WIPP.

In the hazard analysis in Appendix 3A and the accident analysis of Chapter 3 in the DSA, several conservatisms in the source term and consequence analysis yield the 800 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE limit. The conservatively calculated, unmitigated dose consequences exceed the Evaluation Guideline of 25 rem for a bounding WCG fire accident scenario occurring in BUILDING TA-50-69. Prevention or mitigation of the bounding fire scenario consequences is provided by the building and WCG Fire Suppression System (LCO 3/4.2) and the combustible limit control (LCO 3/4.4).

LCO 3.1 Condition Statement #2 – WCRRF $\leq$ 1,800 PE-Ci.

This INVENTORY limit was selected to meet operational needs while limiting the potential consequences of postulated accidents as determined in the safety analysis. The INVENTORY is expressed in terms of plutonium-equivalent curies (PE-Ci) as discussed in the BIO.

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A3/4.1 INVENTORY Limits (cont.)

APPLICABILITY

The INVENTORY limits are applicable to OPERATION MODE and WARM STANDBY MODE.

CONDITION A, ACTIONS and COMPLETION TIMES

Condition A is entered when the INVENTORY within BUILDING TA-50-69 exceeds 800 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE. In this situation, the safest response is to remove at least a portion of the INVENTORY in BUILDING TA-50-69 to restore INVENTORY limits. If this cannot be done quickly, additional ACTION(s) must be taken to assure facility safety. Under this condition, the following ACTION(s) constitute approved measures to control the potential increase in risk associated with the elevated INVENTORY.

ACTION A.1 requires restoring the INVENTORY in BUILDING TA-50-69 by removing the excess INVENTORY from the building within 1 hour. The 1-hour period is reasonable to allow for the removal of the WASTE CONTAINER(s) from BUILDING TA-50-69. The 1-hour period is short enough that the overall risk of an accident during this period of time that could impact the entire INVENTORY in the BUILDING TA-50-69 is small.

ACTION A.2.1. As an alternative to INVENTORY limit restoration, Step A.2.1requires ensuring that the combustible loading meets the requirements in LCO 3.4 in the affected area within 2 hours. Limiting combustible loading reduces the probability of a large fire while restoration of BUILDING TA-50-69 INVENTORY limits is ongoing.

ACTION A.2.2 requires establishment of a FIRE PATROL in BUILDING TA-50-69 within 2 hours, which is an ACTION that reduces the overall risk imposed by excess INVENTORY. Once the FIRE PATROL is established, the FIRE PATROL shall sweep through BUILDING TA-50-69 at least once per hour. The safety analysis demonstrates that fire accidents result in the most severe offsite consequences to BUILDING TA-50-69. A FIRE PATROL compensates for an out-of-specification condition by providing inspection of BUILDING TA-50-69 for an incipient fire such that appropriate notification and fire-fighting response may be initiated, thus minimizing the potential for an offsite release. The FIRE PATROL can also prevent or correct potential fire risk/hazard situations (e.g., unauthorized hot work or combustible material shipments) and can take measures to extinguish small fires. Two hours is a reasonable time period to locate appropriate FIRE PATROL personnel and start inspections. Hourly sweeps by the FIRE PATROL are in accordance with institutional requirements and are a reasonable time period given the INVENTORY will be in a SAFE CONFIGURATION and the combustible loading controls minimize the potential for fires impacting the INVENTORY.

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A3/4.1 INVENTORY Limits (cont.)

ACTION A.2.3 requires placing the BUILDING TA-50-69 in WARM STANDBY within 24 hours. When INVENTORY limits cannot be restored, placing the facility in WARM STANDBY places the material in a SAFE CONFIGURATION and restricts activities to those which will contribute to INVENTORY restoration.

ACTION A.2.4 requires restoring BUILDING TA-50-69 within INVENTORY limits within 7 days. This time allows WASTE CONTAINERS to be packaged and moved out of BUILDING TA-50-69.

CONDITION B, ACTIONS and COMPLETION TIMES

Condition B is entered when the INVENTORY within the WCRRF exceeds 1800 PE-Ci. Under this condition, the following ACTIONS constitute compensatory measures to control the potential increase in risk associated with the elevated INVENTORY. If this cannot be done quickly, additional ACTIONS must be taken to assure facility safety.

ACTION B.1 requires restoring the INVENTORY in the WCRRF by removing the excess INVENTORY from the WCRRF within 1 hour. The 1-hour period is reasonable to allow for the removal of the WASTE CONTAINER(s) from WCRRF. The 1-hour period is short enough that the overall risk of an accident during this period of time that could impact the entire INVENTORY in the WCRRF is small.

ACTION B.2.1 requires a FIRE PATROL be established within 2 hours, which is an ACTION that reduces the overall risk imposed by excess INVENTORY. Once the FIRE PATROL is established, the FIRE PATROL shall sweep through WCRRF at least once per hour. The safety analysis demonstrates that fire accidents result in the most severe offsite consequences at WCRRF. A FIRE PATROL compensates for an out-of-specification condition by providing inspection of WCRRF for an incipient fire such that appropriate notification and fire-fighting response may be initiated, thus minimizing the potential for an offsite release. The FIRE PATROL can also prevent or correct potential fire risk/hazard situations (e.g., unauthorized hot work or combustible material shipments) and can take measures to extinguish small fires. Two hours is a reasonable time period to locate appropriate FIRE PATROL personnel and start inspections. Hourly sweeps by the FIRE PATROL are in accordance with institutional requirements and are a reasonable time period given the INVENTORY will be in a SAFE CONFIGURATION and the combustible loading controls minimize the potential for fires impacting the INVENTORY.

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A3/4.1 INVENTORY Limits (cont.)

ACTION B.2.2 requires placing the WCRRF in WARM STANDBY within 24 hours. When INVENTORY limits cannot be restored, placing the WCRRF in WARM STANDBY places the material in a SAFE CONFIGURATION and restricts activities to those which will contribute to INVENTORY restoration.

ACTION B.2.3 Requires restoring WCRRF within INVENTORY limits within 7 days. This time allows WASTE CONTAINERS to be packaged and moved out of WCRRF.

SURVEILLANCE REQUIREMENTS

SR 4.1.1

This SR requires the VERIFICATION prior to WASTE CONTAINER movement into BUILDING TA-50-69 that the WASTE CONTAINER(s) does not cause the BUILDING TA-50-69 to exceed the 800 PE-Ci of EQUIVALENT COMBUSTIBLE WASTE limit. This VERIFICATION is sufficient to maintain the BUILDING TA-50-69 INVENTORY within the LCO limit.

SR 4.1.2

This SR requires the VERIFICATION prior to WASTE CONTAINER shipment that the WASTE CONTAINER(S) does not cause the WCRRF INVENTORY to exceed the 1800 PE-Ci limit. This VERIFICATION is sufficient to maintain the WCRRF INVENTORY within the LCO limit.

REFERENCES

Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant, Appendix B (^{239}Pu Equivalent Activity), DOE/WIPP-02-3122, DOE Carlsbad Field Office, Revision 2.0, November 15, 2004.

Source Term and Consequence Analysis for Combustible (Plutonium-239) Equivalency for Environmental Management Waste Forms, SBDO: CALC 07-026, Los Alamos National Laboratory, Los Alamos, NM, 2007.

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A3/4.2 FIRE SUPPRESSION SYSTEM

BACKGROUND SUMMARY

Fire-fighting water is gravity fed from a 500,000-gal storage tank that supplies water to all TA-50 facilities. A 12-inch site water main supplies water to a 6-inch branch water line, which provides fire-fighting water to BUILDING TA-50-69. A single fire suppression system is provided for BUILDING TA-50-69 and consists of a wet pipe sprinkler system that protects the building and the GBE. The fire suppression system is hydraulically designed for NFPA Ordinary Hazard Group 2 coverage. Fire sprinkler water flows from the building floor drains through a common drain line that flows to the Radioactive Liquid Waste Treatment Facility (RLWTF). The drain lines are capable of collecting water from a few sprinklers and routing it to the RLWTF. For larger fires with many sprinklers operating and Fire Department usage of hose suppression, the floor drains have insufficient capacity to flow all the fire water to the RLWTF and fire water may flow outside BUILDING TA-50-69 unless emergency action is taken.

APPLICATION TO SAFETY ANALYSIS

The fire suppression system provides a mitigative function for fire accidents inside BUILDING TA-50-69 and the GBE. Moreover, the fire suppression system can control or suppress a fire inside BUILDING TA-50-69 (and the GBE), thus limiting fire severity and growth and minimizing the potential for offsite dose consequences.

The accident analysis considers the fire suppression system as mitigating the consequence of a facility fire, preventing the spread of a fire to a full BUILDING TA-50-69 fire and cooling combustion gases to protect BUILDING TA-50-69 HEPA filters.

For the building fire, the consequence analysis considers that the fire suppression system will be effective in reducing the INVENTORY that may be impacted by a fire in BUILDING TA-50-69, limiting this value to that affected until sprinkler actuation occurs.

Activation of the WCG portion of the FSS may compromise the containment/ confinement of the glovebox as a result of the anticipated release of fire water from the WCG to the building, and possible loss of vacuum by over-pressurization of the WCG or clogging of the WCG HEPA filters. However, rapid fire suppression should help to minimize airborne releases, and any radioactive material released to the building should be entrained in firewater. Overall, the potential for exposure to radioactive material by workers, the public, and the environment would be reduced. The sprinkler discharge is considered a potential cause of a loss of glovebox containment/confinement in the hazard analysis, but the intrinsic benefit of fire water entrainment is not credited with event mitigation in the hazard and accident analyses.

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A3/4.2 FIRE SUPPRESSION SYSTEM (cont.)

LCO

BUILDING TA-50-69 shall have an OPERABLE fire suppression system composed of the following:

LCO 3.2 Condition Statement #1 – A open and unobstructed flow path from the water supply tank to the BUILDING TA-50-69 sprinkler heads.

A clear and unobstructed flow path from the BUILDING TA-50-69 fire suppression sprinkler connected with the supply source ensures fire suppression water is available upon demand as credited in the accident analysis. The clear and unobstructed flow path is verified by ensuring the valves from the supply source to BUILDING TA 50-69 and WCG sprinkler heads are properly aligned. All flow valves to building fire suppression are fully open and valves that allow flow from the source to the building to be bypassed are fully closed.

LCO 3.2 Condition Statement #2 – A riser gauge static pressure of 48 psig or greater at the base of the riser.

An adequate riser gauge static pressure ensures sufficient hydraulic force is present to provide fire suppression water to the hydraulically most remote sprinkler(s).

LCO 3.2 Condition Statement #3 – The water supply tank contains 100,000 gal. or greater.

This LCO ensures that adequate fire-fighting water exists to combat a 2-hour fire at the WCRRF and a 2-hr, 250 gpm hose stream allowance at another facility.

LCO 3.2 Condition Statement #4 – The temperature of Building TA-50-69, including the attic space, is greater than 40 ºF.

This LCO ensures that the fire sprinkler system pipes do not freeze as a result of inclement weather. A temperature of 40 ºF is chosen because it corresponds to a ventilation interlock which will shutdown the building's supply air (HVA-001) to minimize the introduction of cold air into the building. (The ventilation interlock is not credited with any preventive or mitigative safety function.) This interlock function requires operator response before the ventilation system can be returned to normal operation. Using the 40 ºF allows for equipment uncertainty and for a sufficient response time to minimize the potential of falling below 32 ºF in the building.

APPLICABILITY

This LCO is applicable to BUILDING TA-50-69 during the OPERATION MODE and WARM STANDBY MODE. Whenever INVENTORY is present and a potential fire occurs, the fire suppression system operation is required. It does not apply to the balance of the WCRRF, i.e., outside storage of TRU WASTE CONTAINERS or in COLD STANDBY MODE since there will be no INVENTORY in BUILDING TA-50-69.

APPENDIX A – BASES

A3/4.2 FIRE SUPPRESSION SYSTEM (cont.)

CONDITION A, ACTIONS and COMPLETION TIMES

Condition A is entered when the fire suppression system is INOPERABLE. Under this condition, the following ACTIONS constitute approved measures to account for the INOPERABILITY of the fire suppression system and associated increase in risk.

ACTION A.1 requires that INVENTORY be placed in a SAFE CONFIGURATION IMMEDIATELY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This ACTION reduces the potential source term in the event of an accidental release of INVENTORY.

ACTION A.2 requires establishment of a FIRE PATROL in BUILDING TA-50-69 within 2 hours, which is an ACTION that reduces the overall risk imposed by an INOPERABLE fire suppression system. Once the FIRE PATROL is established, the FIRE PATROL shall sweep through BUILDING TA-50-69 at least once per hour. The safety analysis demonstrates that fire accidents result in the most severe offsite consequences to BUILDING TA-50-69. A FIRE PATROL compensates for an out-of-specification condition by providing inspection of BUILDING TA-50-69 for an incipient fire such that appropriate notification and fire-fighting response may be initiated, thus minimizing the potential for an offsite release. The FIRE PATROL can also prevent or correct potential fire risk/hazard situations (e.g., unauthorized hot work or combustible material shipments) and can take measures to extinguish small fires. Two hours is a reasonable time period to locate appropriate FIRE PATROL personnel and start inspections. Hourly sweeps by the FIRE PATROL are in accordance with institutional requirements and are a reasonable time period given the INVENTORY will be in a SAFE CONFIGURATION and the combustible loading controls minimize the potential for fires impacting the INVENTORY.

ACTION A.3.1 requires that the fire suppression system be restored to OPERABLE within 7 days. Operating experience indicates that 7 days is adequate to accomplish troubleshooting and repair efforts for typical system problems, including a loss of water supply due to a pipe leak. The probability of a fire is frequency category III.

ACTION A.3.2 requires that the BUILDING TA-50-69 be placed in COLD STANDBY within 7 days. This ACTION reduces the impact of an INOPERABLE fire suppression system by decreasing the susceptibility of processes and materials to potential fires by removing the INVENTORY from BUILDING TA-50-69. This time period is reasonable to complete all activities associated with correcting straightforward problems, and allows for activities associated with a transfer of INVENTORY, including scheduling for transportation and security. In COLD STANDBY, the LCO is no longer applicable.

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A3/4.2 FIRE SUPPRESSION SYSTEM (cont.)

SURVEILLANCE REQUIREMENTS

SR 4.2.1

The static gauge pressure at the base of the riser is VERIFIED to be ≥ 48 psig once per work day when WCRRF is in OPERATION or WARM STANDBY mode. This surveillance checks that adequate pressure is available at the base of the riser for proper sprinkler operation (as determined through hydraulic calculation) and provides positive indication that water supply exists.

LANL Calculation ER-FP-07-042 determined that the minimum static pressure for demand with a 5% margin is 47.0 psig. The 5% margin allows for any small discrepancies in the design assumptions used in the calculation. The pressure gauge used to meet this surveillance shall have a total accuracy of less than or equal to +/- 0.8 psig, and any equipment used to calibrate the pressure gauge shall have a total accuracy of less than or equal to 25% of the gauges total accuracy. Based on the above discussion, the installed and calibrated pressure gauge shall have an accuracy of less than or equal to 1.0 psig. Therefore, the SURVEILLANCE REQUIREMENT shall have a minimum static pressure of > 48.0 psig. The pressure gauge used to meet this surveillance may be either analog or digital as long as the accuracy and tolerance requirements are met.

SR 4.2.2

This surveillance VERIFIES that adequate fire-fighting water exists to combat a two-hour fire in BUILDING TA-50-69. The volume required includes a 250 gpm hose stream allowance for simultaneous fire-fighting at another facility. The 500,000 gallon water tank that provides fire-fighting water is county-owned, and a Memorandum of Understanding (MOU) exists between the county and NNSA/DOE for the operation of this tank. A WEEKLY periodicity to ensure adequate capacity is available is considered reasonable because of the provisions of the MOU.

SR 4.2.3

This SR requires that all post indicator valves within the facility boundary be VERIFIED in the locked open position on a MONTHLY basis. The VERIFICATION of valve position provides assurance that an unobstructed flow path exists and that water supply is available to the sprinkler coverage zones.

The SR FREQUENCY meets NFPA 25 requirements (see References).

SR 4.2.4

This surveillance VERIFIES that the control valve alignment provides an unobstructed flow path from gravity tank to the BUILDING TA-50-69 sprinkler heads. The surveillance is required to be performed on a MONTHLY basis. (NFPA 25)

SR 4.2.5

A hydrant flow test is conducted ANNUALLY by flowing water through local hydrants and recording residual pressure and flow. This surveillance verifies the adequacy of water supply to meet system flow and pressure demand minimum requirements that were established by ER-FP-07-042. These parameters are assessed to determine the condition of the fire water supply and whether sprinkler demand requirements can be met by comparing a graph of the test

APPENDIX A – BASES

A3/4.2 FIRE SUPPRESSION SYSTEM (cont.)

points (water supply curve) with the maximum demand point (combined pressure and flow for sprinklers and hose streams).

A minimum flow of 556 gpm at a pressure of no less than 46.8 psig for Ordinary Hazard Group 2 at the base of the riser ensures that the sprinkler head most remote from the riser receives 24.7 gpm. The 556 gpm flow rate includes a fire hose allowance of 250 gpm.

This SR is conducted in accordance with NFPA 25 requirements.

SR 4.2.6 This SR demonstrates ANNUALLY that normal pressure variations are achieved when flowing water through the 2-inch main drain valve at each riser. A fully or partially closed valve or other obstruction in the supply piping will cause an abnormally large drop in full flow pressure in the 2-inch main drain when opened and a slow return to normal static pressure when closed. Normal variations in pressure indicate that all valves in the flow path from the fire main up to the sprinkler riser are open and that no other obstructions exist in the piping leading to the sprinkler riser exist. System pressure must return to normal operating pressure upon closure of the main drain valve.

The SR FREQUENCY meets NFPA 25 requirements.

SR 4.2.7 Calibrating the FSS riser pressure gauge ANNUALLY ensures the instrument accuracy remains within the limits assumed in the LCO.

SR 4.2.8 The temperature readings of TE/TI-001 and TE/TI-002 are VERIFIED to be greater than 40 °F and the facility will verify that the temperature remained above 40 °F for a minimum of 48 hours. The surveillance is performed once per work day when WCRRF is in the OPERATION or WARM STANDBY mode. This surveillance ensures that the building and attic temperatures are adequate to prevent ice in the fire suppression pipes in Building TA-50-69.

Calculation CALC-10-TA5000069-003, *Evaluate Frozen Fire Water Piping*, determined that it would take 42 hours to completely thaw a frozen cross-section of ice in a 3-in. pipe once the building temperature reached 40 °F. The calculation assumes that the initial temperature in the pipe was at 5 °F. For additional conservatism, the thaw period is increased to 48 hours.

The building fire riser contains both 6-in. and 4-in. piping. However, the complete freezing of these larger pipes is not a concern due to the amount of time required to completely freeze the large ones and their location next to multiple heat sources (e.g., underground water supply and concrete slab).

The Building TA-50-69 ventilation system includes a 40 °F interlock, which automatically shuts down the building's supply air (HVA-001) to minimize the introduction of cold air into the building. This interlock function requires operator response before the ventilation system can be returned to normal operation. The operator response time would be sufficient to prevent the complete freezing of the larger piping.

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A3/4.2 FIRE SUPPRESSION SYSTEM (cont.)

Use of temperature loops TE/TI-001 and TE/TI-002 is adequate to ensure that the building and attic temperatures are above 40 °F. To ensure the temperature has been above 40 °F for 48 hours, operations can verify that the ventilation did not interlock on a low temperature of 40 °F during the previous 48 hours. Performing the above verifications on a daily basis is considered adequate to prevent freezing in the fire suppression piping.

SR 4.2.9 Performing an instrument loop verification and interlock check for TE/TI-001 and TE/TI-002 ANNUALLY ensures equipment accuracy and that the 40 °F ventilation interlock functions within the limits assumed in the LCO. The credited function of the 40 °F ventilation interlock for this surveillance is that the Operator Interface Terminal (OIT) on the ventilation PLC indicates activation of the interlock and the indication does not clear until Operations resets the interlock.

SR 4.2.10 This SR requires that the valve FS-V-017 for the WCG sprinkler head be VERIFIED in the open position on a WEEKLY basis. The VERIFICATION of valve position provides assurance that an unobstructed flow path exists and that water supply is available to the sprinkler coverage zones.

This SR FREQUENCY meets NFPA 25 requirements.

REFERENCES

Waste Characterization, Reduction, and Repackaging Facility Fire Hazard Analysis, ER-FP-07-054, Rev. 4, Los Alamos National Laboratory, Los Alamos, NM, April 20, 2007.

National Fire Alarm Code, NFPA 72, Quincy, MA, National Fire Protection Association, 2002.

Standard for the Installation of Private Fire Service Mains and their appurtenances, NFPA 24, Quincy, MA, National Fire Protection Association, 2002.

Standard for the Installation of Sprinkler Systems, NFPA 13, Quincy, MA, National Fire Protection Association, 2002.

Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, NFPA 25, Quincy, MA, National Fire Protection Association, 2002.

Fire TA 50-69 (WCRRF) Sprinkler Hydraulic Calculation, ER-FP-07-042, Los Alamos National Laboratory, Los Alamos, NM, April 2007.

Evaluate Frozen Fire Water Piping, CALC-10-TA5000069-003, Los Alamos National Laboratory, Los Alamos, NM January 2010.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system

BACKGROUND SUMMARY

BUILDING TA-50-69 employs the zone concept of contamination control, wherein air is drawn from areas with the lowest potential for contamination into areas with increasingly greater amounts of potential contamination. In addition to a negative air pressure gradient toward areas of higher contamination potential, this flow is accomplished through the physical configuration of equipment provided by enclosures, walls, roof, and portals such as doors and glovebox ports.

The ventilation system is composed of one common supply air/HVAC system and three autonomous exhaust trains: one is associated with the WCG and GBE ventilation system (FE-003), and two are associated with the main building ventilation (FE-001 and FE-002).

The supply air/HVAC system and the building exhaust systems are designed and controlled to maintain a negative pressure inside the building relative to atmospheric pressure outside the structure. Air cleaning equipment for the FE-001 and FE-002 exhaust consists of pre-filters and nuclear-grade HEPA filters, which have a minimum in-place efficiency of 99.95%. The nuclear grade filters for FE-001 and FE-002 are tested in accordance with DOE-HDBK-1169-2003 using a photometer.

The HEPA filters in the air exhaust systems support maintaining passive confinement of INVENTORY during an accidental release inside BUILDING TA-50-69. The LCO includes OPERABILITY (i.e., pressure differential and filter OPERABILITY) requirements for the exhaust system HEPA filters.

The exhaust fan (FE-002) and filtration system for the main process area exhaust system is located outside the building, mounted on a concrete pad adjacent to the west wall of the building. The exhaust fan (FE-001) and filtration system is located on the mezzanine.

BUILDING TA-50-69 has a vehicle airlock that is used for moving WASTE CONTAINERs into and out of the building. The airlock floor space is approximately 360 ft^2. The airlock is separated from the outside environment and the main process area inside the building by a pair of vehicle airlock doors. One door opens to the outside and the other door separates the main process area from the airlock. The vehicle airlock also helps ensure the building confinement is maintained while personnel and materials move into and out of the building.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system (cont.)

The Electrical Distribution System (EDS) supports the normal operation of the confinement ventilation system but is not required to support the confinement ventilation system's safety function (i.e., mitigate the release of MAR, by providing passive secondary confinement in conjunction with the building's structural integrity). The EDS provides power to the fans of the confinement ventilation system. Loss of power from the EDS leads to a loss of ventilation fans, which is covered by the LCO and no specific TSR coverage is required for the EDS. The UPS supports the safety-significant confinement ventilation system by providing conditioned power to the ventilation control system, including the operator interface terminal (OIT) during normal operation, and providing power to required loads for at least 1 hour upon loss of offsite power. Loss of the UPS could lead to a failure of ventilation fans that are required for normal operation, and the UPS is covered by the LCO/SR to ensure OPERABILITY of the UPS.

APPLICATION TO SAFETY ANALYSIS

The BUILDING TA-50-69 air exhaust HEPA filters, in conjunction with BUILDING TA-50-69 structural integrity and airlock operation, provide a passive, mitigative function for accidental releases inside BUILDING TA-50-69 by filtering potential releases of airborne INVENTORY from BUILDING TA-50-69, even if the negative pressure is lost because of an air exhaust system failure. Although the building confinement ventilation system is credited with providing some secondary confinement, the accident analysis conservatively assumes a leak path factor of 1.0 and the release of a small percentage of unfiltered air (e.g., through the exhaust from vacuum pumps for the continuous air monitors, ventilation fan motor shaft assemblies, or leakage from gaskets, seals, or penetrations downstream of the HEPA filters) does not adversely affect the outcome of the conservatively calculated accident consequences.

LCO 3.3.1 Condition Statement #3 - BUILDING TA-50-69 CONFINEMENT INTEGRITY is intact.

LCOs 3.3.1 Condition Statements #1, #2, and #3 are based on ensuring that there exists a negative pressure differential between BUILDING TA-50-69 and the atmosphere and that the exhaust train (FE-001 and FE-002) filters are not clogged. DOE-HDBK-1169-2003, the *DOE Nuclear Air Cleaning Handbook*, recommends limiting in-service pressure drops to 3 to 5 inches above startup pressures. To account for momentary fluctuations, a negative pressure with respect to atmospheric is defined as OPERABLE.

LCO 3.3.1 Condition Statement #2 also ensures that the exhaust from BUILDING TA-50-69 is filtered to minimize any potential discharge to the environment.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system (cont.)

LCO 3.3.1 Condition Statement #3 requires that BUILDING TA-50-69 confinement is intact. Again, this is assumed in the accident analysis to provide a passive confinement boundary.

LCO 3.3.1 Condition Statement #4 requires that the UPS shall provide power to required loads for at least 1 hour upon loss of offsite power. The UPS is a support system for the confinement ventilation control system. Failure of the UPS could lead to a shutdown of the ventilation fans, thus the UPS must be OPERABLE. One hour is considered a sufficient amount of time to detect the loss of ventilation fans due to the loss of offsite power, activate an alarm, and allow operator action.

LCO 3.3.1 Condition Statement #5 requires that the ventilation control system activate an alarm when the differential pressure between BUILDING TA-50-69 and the outside atmosphere is greater than -0.05 inches wc. The ventilation control system is part of the confinement ventilation system, and provides indication (i.e, alarm, after a programmed delay time) to personnel that the ventilation system negative pressure differential within BUILDING TA-50-69 may be diminishing so that operators may take action.

Note that a pressure drop LCO is not specified for the air supply system filters because it is not important to the system's safety function. The air supply system filter was not credited in the accident analysis for providing a passive confinement boundary.

APPLICABILITY

LCOs 3.3.1 Condition Statements #1 through #5 are applicable during OPERATION and WARM STANDBY, because INVENTORY may be present inside BUILDING TA-50-69.

CONDITION A, ACTIONS and COMPLETION TIMES

Condition A is entered following a loss of negative pressure between BUILDING TA-50-69 and the outside atmosphere. Under this condition, the following ACTIONS constitute approved measures to minimize risk.

ACTION A.1 requires IMMEDIATELY shutting down the BUILDING TA-50-69 supply fans to prevent pressurization of the building. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This ACTION reduces the potential consequence in the event of an accidental release of INVENTORY.

APPENDIX A – BASES

A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system (cont.)

ACTION A.2 requires that INVENTORY be placed in SAFE CONFIGURATION IMMEDIATELY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This ACTION reduces the potential source term in the event of an accidental release of INVENTORY.

ACTION A.3 requires that the negative pressure be restored to an OPERABLE status within 7 days. A 7-day completion time is reasonable for this ACTION due to the placement of INVENTORY in a SAFE CONFIGURATION in TA-50-69 by ACTION A.2 and is a reasonable time to fix most problems with the ventilation system.

CONDITION B, ACTIONS and COMPLETION TIMES

Condition B is entered when the air exhaust system (FE-002) HEPA filters do not meet the LCO requirements. Under this condition, the following ACTIONS constitute compensatory measures to account for the INOPERABLE HEPA filters and the associated increase in risk.

ACTION B.1 requires that INVENTORY be placed in a SAFE CONFIGURATION IMMEDIATELY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This ACTION reduces the potential source term in the event of an accidental release of INVENTORY.

ACTION B.2 requires shutdown of BUILDING TA-50-69 supply (HVA-1) and exhaust (FE-002) fans IMMEDIATELY. This ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed after INVENTORY is in a SAFE CONFIGURATION. This ACTION reduces the potential for distribution of INVENTORY to the environment through degraded HEPA filters in the event of an accidental release of INVENTORY.

ACTION B.3 requires restoration of HEPA filters to OPERABLE status within 7 days. A 7-day completion time is reasonable for this ACTION due to the placement of INVENTORY in a SAFE CONFIGURATION in BUILDING TA-50-69 by ACTION B.2 and is a reasonable time to fix most problems with the ventilation system.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system (cont.)

CONDITION C, ACTIONS and COMPLETION TIMES

Condition C is entered when BUILDING TA-50-69 exhaust train HEPA filters (FE-001) are INOPERABLE. Under this condition, the following ACTION constitutes the required compensatory measure to control the potential increase in risk associated with additional leakage path.

ACTION C.1 requires that fan FE-001 be shut down IMMEDIATELY. Shutdown of the exhaust fan minimizes the release in an accident by reducing the flow through the degraded HEPA filters.

ACTION C.2 requires that fan FE-001 damper be closed IMMEDIATELY. Closing of the exhaust fan damper minimizes the release in an accident by minimizing the flow through the degraded HEPA filters.

CONDITION D, ACTIONS and COMPLETION TIMES

Condition D is entered when BUILDING TA-50-69 CONFINEMENT INTEGRITY is INOPERABLE. Under this condition, the following ACTION constitutes the required compensatory measures to control the potential increase in risk associated with additional leakage path.

ACTION D.1 requires restoration of BUILDING TA-50-69 CONFINEMENT INTEGRITY IMMEDIATELY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This ACTION restores the limiting condition, allowing exit of the LCO ACTION.

Or, if ACTION D.1 cannot be met, ACTION D.2 requires that INVENTORY be placed in a SAFE CONFIGURATION within 2 hours. This ACTION reduces the potential source term in the event of an accidental release of INVENTORY in the event that the BUILDING TA-50-69 CONFINEMENT INTEGRITY cannot be restored.

CONDITION E, ACTIONS and COMPLETION TIMES

Condition E is entered when the UPS is INOPERABLE. Under this condition, the following ACTIONS constitute compensatory measures to control the potential increase in risk associated with an INOPERABLE UPS.

ACTION E.1 requires placing the INVENTORY in a SAFE CONFIGURATION IMMEDIATELY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This action is required because an INOPERABLE UPS could cause ventilation fans to shut down. Placing INVENTORY in a SAFE CONFIGURATION while the UPS is INOPERABLE minimizes the possibility that waste material could be dispersed in the event of a ventilation fan shutdown during processing.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system (cont.)

ACTION E.2 requires restoration of the UPS to OPERABLE status within 7 days. A 7-day completion time is reasonable for this action due to the placement of INVENTORY in a SAFE CONFIGURATION in BUILDING TA-50-69 by ACTION E.1 and is a reasonable time to fix most problems with the UPS.

CONDITION F, ACTIONS and COMPLETION TIMES

Condition F is entered when the ventilation control system is INOPERABLE. Under this condition, the following ACTIONS constitute compensatory measures to control the potential increase in risk associated with an INOPERABLE ventilation control system.

ACTION F.1 requires placing the INVENTORY in a SAFE CONFIGURATION IMMEDIATLEY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This action is required because an INOPERABLE ventilation control system means that no alarm function is available to alert operators that the ventilation differential pressure could become greater than minus 0.05 inches wc.

ACTION F.2 requires restoration of the ventilation control system to OPERABLE status within 7 days. A 7-day completion time is reasonable for this action due to the placement of INVENTORY in a SAFE CONFIGURATION in BUILDING TA-50-69 by ACTION F.1 and is a reasonable time to fix most problems with the ventilation control system.

CONDITION G, ACTIONS and COMPLETION TIMES

Condition G is entered when the ACTIONS and associated completion times of Condition A, B, C, D, E, or F are not met. Under this condition, the following ACTIONS constitute compensatory measures to control the potential increase in risk associated with exceeding the allowable time with an increased INVENTORY.

ACTION G.1 requires placing the WCRRF in COLD STANDBY within 7 days. The condition is beyond the risk anticipated in the DSA and will provide time to place the WCRRF in a safe, de-inventoried MODE until corrective actions can be established that will allow facility resumption.

7 days is considered a reasonable time to package INVENTORY, and transport TRU WASTE CONTAINERs out of BUILDING TA-50-69, given that the INVENTORY will be in a SAFE CONFIGURATION.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system (cont.)

SURVEILLANCE REQUIREMENTS

SR 4.3.1.1 Conducting an in-place HEPA filter (FE-001 and FE-002) aerosol efficiency test in accordance with DOE-HDBK-1169-2003 using a photometer, and demonstrating a filtering efficiency greater than 99.95%, is a positive method of affirming that the air exhaust system HEPA filter is OPERABLE and can perform as assumed in the hazard and accident analyses. Annual testing ensures that filter degradation or blockage is not occurring and testing following filter replacement or maintenance ensures proper installation of the HEPA filter.

SR 4.3.1.2 Verifying the pressure drop across each online exhaust HEPA (FE-001 and FE-002) filter is less than 3.5 inches wc is a good indication that the exhaust system HEPA filters are operating as designed. The 3.5 inches wc limit is conservative since the exhaust HEPA filters are not rated to fail until 10.0 inch wc. Therefore, the accuracy for instrumentation used to meet this surveillance is negligible and no instrument accuracy limitations are required. Before placing the nuclear HEPA filter on line, the filter is aerosol tested and the pressure drop is merely an indication that the filter is functioning. Too high a reading is a strong indication that the filter is clogging and needs to be replaced. Verifying that the pressure differential across the filter is within range every day is a conservative FREQUENCY and exceeds DOE-HDBK-1169-2003 requirements.

The exhaust fan on train FE-001 is not always operated. When the fan is off, the differential pressure does not need to be verified. When the fan is not operating, OPERABILITY of the HEPA filter is demonstrated by SR 4.3.1.1. The following NOTE is included in the SR:

NOTE: The pressure drop across air exhaust train HEPA filters on FE-001 must be verified DAILY, only when the ventilation fan is on.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system (cont.)

SR 4.3.1.3 The building differential pressure is monitored by using the operator interface terminal (OIT), which uses a pressure transducer and PLC module. The pressure transducer has an accuracy of +/- 0.01 inches wc and the PLC module has an input accuracy of +/- 0.0005 inches wc, which gives the loop a total accuracy of +/- 0.0105 inches wc. Therefore the DAILY SURVEILLANCE REQUIREMENT of having negative pressure with respect to the outside atmosphere can be met by surveilling the building differential pressure to VERIFY it is less than – 0.05 inches wc. A DAILY SURVEILLANCE by operations personnel is acceptable because the ventilation control system monitors differential pressure and activates an alarm (after a programmed delay time) if it is out of range.

SR 4.3.1.4 VERIFYING BUILDING TA-50-69 CONFINEMENT INTEGRITY exists protects the assumptions in the accident analysis. A DAILY surveillance is considered adequate to protect this assumption.

SR 4.3.1.5 Performing a CHANNEL CALIBRATION ANNUALLY on the differential pressure gauge control loops on the BUILDING TA-50-69 Confinement Ventilation System and the FE-002 HEPA filter used to perform SRs 4.3.1.2 and 4.3.1.3 ensures that the instrument can accurately measure the limit specified in the LCO. An ANNUAL SURVEILLANCE frequency for this test is the recommended frequency in the *TSR Document of Example Technical Safety Requirements, Volume 1: Examples, 2001.*

SR 4.3.1.6 VERIFYING ANNUALLY that the UPS is capable of providing power to required loads for at least 1 hour ensures that, upon loss of offsite power, the UPS will be capable of providing power to the ventilation controls system to detect the loss of ventilation fans due to the loss of offsite power, activate an alarm, and allow operator action. The required loads include the programmable logic controllers, the differential pressure sensors, and the OIT and alarms of the confinement ventilation control system. However, the UPS also powers other loads, such as CAMs. The surveillance shall be performed with the UPS providing power to all loads to VERIFY that the UPS can supply power to required loads for 1 hour.

APPENDIX A – BASES

A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.1 BUILDING TA-50-69 Confinement ventilation system (cont.)

SR 4.3.1.7 Performing a QUARTERLY CHANNEL FUNCTIONAL TEST VERIFIES that the ventilation control system activates an alarm (after a programmed delay time) when the differential pressure between BUILDING TA-50-69 and the outside atmosphere is greater than -0.05 inches wc and ensures that the alarm function is operational to provide indication to operations personnel of ventilation fluctuations that could affect the negative differential between the BUILDING TA-50-69 and the outside atmosphere. To accommodate normal supply and exhaust fan start-up and shutdown sequencing, the control system has appropriate time delays between the detection of increasing differential pressure and the activation of alarms. The differential pressure alarms and responses are not credited with mitigation of any accident consequences. Therefore, the 5- to 30-second time delays have no effect on the predicted consequences of material release accidents. A QUARTERLY SURVEILLANCE frequency for this test is the recommended frequency in the *TSR Document of Example Technical Safety Requirements,* Volume 1: *Examples,* 2001.

SR 4.3.1.8 Calibrating the differential pressure gauge on the FE-001 HEPA filter ANNUALLY ensures that the instrument can accurately measure the limit specified in the LCO.

REFERENCES

Nuclear Air Cleaning Handbook, DOE-HDBK-1169-2003, December 2003.

TSR Document of Example Technical Safety Requirements, Volume 1: Examples, Defense Programs, U.S. Department of Energy, Washington, D.C., 2001.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.2 WCG GLOVEBOX CONFINEMENT

BACKGROUND SUMMARY

BUILDING TA-50-69 employs the zone concept of contamination control, wherein air is drawn from areas with the lowest potential for contamination into areas with increasingly greater amounts of potential contamination. In addition to a negative air pressure gradient toward areas of higher contamination potential, this flow is accomplished through the physical configuration of equipment provided by enclosures, walls, roof, and portals such as doors and glovebox ports.

There are three independent exhaust systems in BUILDING TA-50-69, each of which consists of ductwork, HEPA filters, a fan, and an exhaust stack. The main process area and WCG/GBE exhaust systems typically operate continuously; the welding hood exhaust system is operated only when local exhaust is required.

The exhaust fans and filtration systems for the WCG/GBE exhaust (FE-003) are located on the mezzanine along with FE-001. The physical enclosure of the GBE (including dampers and airlock doors that are relied upon to control confinement and exhaust flow) is part of the WCG confinement ventilation exhaust system. The FE-003 exhaust system draws air through both the WCG and the GBE with the airflow from the GBE making up approximately 90% of the stream. Air cleaning equipment for the exhaust system consists of pre-filters and two stages of nuclear-grade HEPA filters, which have a combined minimum in-place efficiency of 99.95%. The efficiency between both stages is not specified, since the physical location of the test ports does not allow for individual filter testing. The two-stage HEPA filter assembly in the FE-003 plenum housing will be treated and tested as a single-stage HEPA filter. The FE-003 HEPA filter assembly is tested in accordance with DOE-HDBK-1169-2003 using a photometer for single-stage HEPA systems.

SAC 5.10.2.5 prohibits storage, staging, or processing of INVENTORY within the GBE, but the GBE has doors that were previously used for moving WASTE CONTAINERs into and out of the GBE. The doors act as an airlock for the GBE and one door must be closed at all times to ensure confinement.

The EDS supports the normal operation of the confinement ventilation system but is not required to support the confinement ventilation system's safety function (i.e., to provide primary confinement in the WCG and secondary confinement in the building to mitigate releases, in conjunction with the building's structural integrity). The EDS provides power to the fans of the confinement ventilation system. Loss of power from the EDS leads to a loss of ventilation fans, which is covered by LCO 4.3.1, and no specific TSR coverage is required for the EDS. The UPS serves a safety-significant system support function by providing continuous conditioned power to the ventilation control system during normal operation, and providing power to required loads for at least one hour upon loss of offsite power. Loss of UPS could lead to a failure of ventilation fans, and the UPS is covered by the LCO/SR 3.3.1 to ensure OPERABILITY of the UPS.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.2 WCG GLOVEBOX CONFINEMENT

A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.2 WCG GLOVEBOX CONFINEMENT (cont.)

APPLICATION TO SAFETY ANALYSIS

WCG/GBE air exhaust HEPA filters provide a mitigative function for accidental releases inside BUILDING TA-50-69 by filtering potential releases of airborne INVENTORY from BUILDING TA-50-69, even if the negative pressure is lost because of an air exhaust system failure.

LCO

The following specific controls are required to ensure the OPERABILITY of the WCG confinement and ventilation system:

LCO 3.3.2 Condition Statement #1 – WCG atmosphere shall be maintained negative with respect to the main process area of BUILDING TA-50-69 (as indicated by a differential pressure less than – 0.1 inches wc).

LCO 3.3.2 Condition Statement #2a and #2b – The two stages of WCG (FE-003) HEPA filters shall be OPERABLE. That is, they must have a combined in-place efficiency of at least 99.95%, and the pressure drop across each credited HEPA filter stage shall not exceed 3.5 inches wc.

LCOs 3.3.2 Condition Statements #1 and #2 are based on ensuring that there exists a negative pressure differential between the gloveboxes and the inside building and that the exhaust filter (FE-003) is not clogged. LCO 3.3.2 Condition Statement #2 also ensures that the exhaust from BUILDING TA-50-69 is filtered to minimize any potential discharge to the environment.

LCO 3.3.2 Condition Statement #3 – At least one airlock door shall remain closed. This ensures that the WCG ventilation system maintains primary confinement.

LCO 3.3.2 Condition Statement #4 requires that the ventilation control system activate an alarm when the differential pressure between the WCG and the main process area is greater than minus 0.1 inches wc. The ventilation control system is part of the confinement ventilation system, and provides an alarm (after a programmed delay time) to alert personnel that the ventilation system negative pressure differential within the WCG may be diminishing, so that operators may take action.

APPLICABILITY

LCO 3.3.2 is applicable during OPERATION and WARM STANDBY, because INVENTORY may be present inside the WCG and BUILDING TA-50-69. The HEPA filter also provides passive confinement.

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A3/4.3 BUILDING TA-50-69 CONFINEMENT VENTILATION SYSTEM AND WASTE CHARACTERIZATION GLOVEBOX CONFINEMENT

A3/4.3.2 WCG GLOVEBOX CONFINEMENT

CONDITION A, ACTIONS and COMPLETION TIMES

Condition A is entered when a loss of negative pressure occurs between the glovebox and the BUILDING TA-50-69. Under this condition, the following ACTIONS constitute approved measures to account for the loss of negative pressure and the associated increase in risk.

A note is provided to remind operators that following this ACTION statement also requires entry into LCO 3.3.1.

ACTION A.1 requires shutdown of BUILDING TA-50-69 ventilation supply and exhaust fans IMMEDIATELY. This ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This ACTION reduces the potential for distribution of INVENTORY to the environment through degraded HEPA filters in the event of an accidental release of INVENTORY.

ACTION A.2 requires placing the INVENTORY in a SAFE CONFIGURATION IMMEDIATELY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This ACTION reduces the potential source term in the event of an accidental release of INVENTORY.

ACTION A.3 requires restoring the negative pressure to OPERABLE within 7 days. This time is necessary to allow for the restoration of differential pressure. The probability of a initiating a release of INVENTORY from a WCG accident during this time is unlikely, and the INVENTORY is in a SAFE CONFIGURATION. With inventory in a SAFE CONFIGURATION, 7 days is a reasonable time to fix most problems with the ventilation system. This action restores the condition to OPERABLE.

CONDITION B, ACTIONS and COMPLETION TIMES

Condition B is entered when the glovebox exhaust system HEPA filter does not meet the LCO requirements. Under this condition, the following ACTIONS constitute approved measures to account for the INOPERABLE HEPA filter and the associated increase in risk.

A note is provided to remind operators that following this ACTION statement also requires entry into LCO 3.3.1.

ACTION B.1 requires that INVENTORY be placed in a SAFE CONFIGURATION IMMEDIATELY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This ACTION reduces the potential source term in the event of an accidental release of INVENTORY.

ACTION B.2. This action requires shutdown of all BUILDING TA-50-69 ventilation supply and exhaust fans (including FE-003). This ACTION begins IMMEDIATELY after the INVENTORY has been placed in a SAFE CONFIGURATION and is continuously pursued until the ACTION is

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completed. This ACTION reduces the potential for distribution of INVENTORY to the environment through degraded HEPA filters in the event of an accidental release of INVENTORY.

ACTION B.3 requires restoring the affected HEPA filter to OPERABLE within 7 days. This time is necessary to allow not only for the replacement of the HEPA filter if spare filters are available, but also to test them after replacement. The probability of a initiating a release of INVENTORY from a WCG accident during this time is unlikely considering that the INVENTORY is in a SAFE CONFIGURATION. With inventory in a SAFE CONFIGURATION, 7 days is a reasonable time to fix most problems with the ventilation system.

CONDITION C, ACTIONS and COMPLETION TIMES

Condition C is entered when the GBE airlock doors are both open and fail to maintain confinement.

ACTION C.1 requires IMMEDIATELY closing one GBE airlock door. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. These ACTIONS reduce the likelihood of initiating an accidental release of INVENTORY.

CONDITION D, ACTIONS and COMPLETION TIMES

Condition D is entered when the ventilation control system is INOPERABLE. Under this condition, the following ACTIONS constitute compensatory measures to control the potential increase in risk associated with an INOPERABLE Ventilation Control System.

ACTION D.1 requires placing the INVENTORY in a SAFE CONFIGURATION IMMEDIATELY. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed. This action is required because an INOPERABLE ventilation control system means that no alarm function is available to alert operators that the ventilation differential pressure between the WCG and the main process area of BUILDING TA-50-69 could become greater than minus 0.1 inches wc.

ACTION D.2 requires restoration of the ventilation control system to OPERABLE status within 7 days. A 7-day completion time is reasonable for this action due to the placement of INVENTORY in a SAFE CONFIGURATION in BUILDING TA-50-69 by ACTION D.1 and is a reasonable time to fix most problems with the ventilation control system.

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CONDITION E, ACTIONS and COMPLETION TIMES

Condition E is entered when the ACTIONS and associated completion times of Condition A, B, C, or D are not met. Under this condition, the following ACTIONS constitute compensatory measures to control the potential increase in risk associated with exceeding the allowable time with an increased INVENTORY.

ACTION E.1 requires placing the BUILDING TA 50-69 in COLD STANDBY within 7 days. The condition is beyond the risk anticipated in the DSA and provides time to place the BUILDING TA-50-69 in a safe, de-inventoried MODE until corrective actions can be established that will allow facility resumption. 7 days is considered a reasonable time to package INVENTORY, and transport TRU WASTE CONTAINERs out of BUILDING TA-50-69, given that the INVENTORY is in a SAFE CONFIGURATION.

SURVEILLANCE REQUIREMENTS

SR 4.3.2.1

Conducting ANNUALLY, and after filter replacement or maintenance, an in-place HEPA filter aerosol efficiency test in accordance with DOE-HDBK-1169-2003 using a photometer for single-stage HEPA systems, and demonstrating a combined in-place filtering efficiency of the two stages of HEPA filters greater than 99.95%, is a positive method of affirming that the air exhaust system HEPA filters are OPERABLE and can perform as assumed in the hazard and accident analyses. The efficiency between both stages is not specified, since the physical location of the test ports does not allow for individual filter testing. The two-stage HEPA filter assembly in the FE-003 plenum housing will be treated and tested as a single-stage HEPA filter.

SR 4.3.2.2

Verifying the pressure drop across each online exhaust HEPA filter is less than 3.5 inches wc is a good indication that the exhaust system HEPA filters are operating as designed. The 3.5 inches wc limit is conservative since the exhaust HEPA filters are not rated to fail until 10.0 inches wc. Therefore, the accuracy for instrumentation used to meet this surveillance is negligible and no instrument accuracy limitations are required. Before placing the nuclear HEPA filter on line, the filter is aerosol tested and the pressure drop is merely an indication that the filter is functioning. Too high a reading is a strong indication that the filter is clogging and needs to be replaced. Verifying the pressure differential across the filter is within range every day is a conservative frequency and exceeds DOE-HDBK-1169-2003 requirements.

SR 4.3.2.3

The WCG differential pressure is monitored by using the operator interface terminal (OIT), which uses a pressure transducer and PLC module. The pressure transducer has an accuracy of +/- 0.01 inches wc and the PLC module has an input accuracy of +/- 0.0005 inches wc, which gives the loop a total accuracy of +/- 0.0105 inches wc. Therefore the SURVEILLANCE REQUIREMENT of having negative pressure with respect to the building ventilation can be met by surveilling DAILY the building differential pressure

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to VERIFY it is less than – 0.1 inches wc. A DAILY SURVEILLANCE by operations personnel is acceptable because the ventilation control system monitors the differential pressure and provides a time-delayed alarm if it is out of range. In the event of loss of negative differential pressure concurrent with a WCG confinement breach, continuous air monitors would alarm (without delay) to alert facility workers if airborne contamination was detected.

SR 4.3.2.4 Verifying that at least one GBE airlock door is fully closed protects the assumptions in the accident analysis by ensuring confinement is maintained. A DAILY surveillance is considered adequate to protect this assumption.

SR 4.3.2.5 Performing a CHANNEL CALIBRATION ANNUALLY on the differential pressure gauge control loops used on the WCG Confinement Ventilation System and the FE-003 exhaust HEPA filters used to perform SRs 4.3.2.2 and 4.3.2.3 ensures the instrument can accurately measure the limit assumed in the LCO. An ANNUAL SURVEILLANCE frequency for this test is the recommended frequency in the *TSR Document of Example Technical Safety Requirements, Volume 1: Examples, 2001* (see References).

SR 4.3.2.6 Performing a QUARTERLY CHANNEL FUNCTIONAL TEST VERIFIES that the ventilation control system activates an alarm (after programmed delay time) when the differential pressure between the WCG and the main process area of BUILDING TA-50-69 is less than minus 0.1 inches wc and ensures that the alarm function is operational to provide indication to operations personnel of ventilation fluctuations that could effect the negative differential between the WCG and the main process area. To accommodate normal supply and exhaust fan start-up and shutdown sequencing, the control system has appropriate time delays between the detection of increasing differential pressure and the activation of alarms. The differential pressure alarms and responses are not credited with mitigation of any accident consequences. Therefore, the 5 to 30 second time delays have no effect on the predicted consequences of material release accidents. If increasing pressure was accompanied by an actual loss of WCG confinement, the continuous air monitors (CAMs) would alarm to alert facility workers of airborne radiological material. The CAMs and operator training on CAM alarm response are elements of the Radiation Protection Program.

A QUARTERLY SURVEILLANCE frequency for this test is the recommended frequency in the *TSR Document of Example Technical Safety Requirements,* Volume 1: *Examples,* 2001.

REFERENCES

Nuclear Air Cleaning Handbook, DOE-HDBK-1169-2003, December 2003.

TSR Document of Example Technical Safety Requirements, Volume 1: Examples, Defense Programs, U.S. Department of Energy, Washington, D.C. 2001.

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A3/4.4 BUILDING TA-50-69 COMBUSTIBLE LOADING

BACKGROUND SUMMARY

To reduce the threat of uncontrolled fire loadings and the spread of fire, a strategy for minimizing the fire loading is necessary. Facility fire loading is composed of two elements: fixed combustibles (permanently installed in the facility) and transient combustibles (not permanently installed in the facility). Transient combustibles carried through the exclusion zone by operations personnel or transient combustibles being used by operations personnel under their direct control are not subject to this LCO. The exclusion zone is specifically intended to prevent long-term storage or staging of combustibles, not temporary use of combustibles by operations personnel under their direct control. A Combustible Loading Program with appropriately derived limits is established to minimize the amount of fixed and transient combustibles within the facility that could fuel and sustain a fire. By minimizing the combustibles within the facility, the program reduces the fuel-component of the fire and improves suppression effectiveness. As a result, significant reductions in offsite dose consequences can be achieved. Derivation of the limits associated with the Combustible Loading Program is provided in the Application to Safety Analysis and LIMITING CONDITIONS FOR OPERATION sections below.

APPLICATION TO SAFETY ANALYSIS

This LCO provides a preventive function for fire accident scenarios described in the DSA, which includes several different fire scenarios (external brush fire and internal) and a seismic-induced fire. The hazard and accident analyses credited the implementation of a combustible loading program in preventing fire propagation to the WCG and preventing flashover in the building that may result in release of INVENTORY.

The accident analysis identifies fires as a major class of accident resulting from operational events or natural phenomena events. The fire duration and intensity (heat flux and temperature) are related to the amount of combustible material present (quantity and type) and to the available burning surface area. The average combustible loading (fixed + transient) limit within BUILDING TA-50-69 is $\leq$0.60 lb/ft^2.

The accident analysis shows that combustible levels above 0.60 lb/ft^2 can cause hot-layer temperatures that could lead to flashover conditions and/or result in the ignition of WCG gloves and possibly the ignition of INVENTORY contained in the glovebox. This was conservatively estimated at 500°C. Additionally, the analysis shows that combustible fuel packages within 6 ft from the WCG could ignite the glovebox gloves and cause an INVENTORY release. DSA Appendix 3D represented a variety of fuel packages and it was determined that a 50-lb ordinary combustible fuel package is representative of the facility; therefore, in addition to an exclusion zone around the WCG, ordinary combustibles shall also be separated a minimum of 6 ft away from each other within BUILDING TA-50-69, excluding the change/restrooms. This combustible loading limit excludes the INVENTORY that is being repackaged, the materials and equipment necessary for operation within the WCG exclusion zone, and the combustible components of the forklifts used to move TRU WASTE CONTAINERS within the building. Additionally, combustible material inside and within 10 ft of the exterior of the transportainers shall be limited to those materials and equipment

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that are necessary to perform operational tasks. The allowable combustibles include items such as combustible waste inside a closed TRU WASTE CONTAINER, container labeling, lid restraints, plastic wrapping around empty parent drums, gaskets that prevent rainwater intrusion into the transportainers, and plastic or rubber-wheeled container dollies that may be stored in or near the transportainers. Limiting combustible material loading inside and around the exterior of the metal transportainers which contain TRU WASTE CONTAINERS limits the continuity of combustibles that would allow fire spread.

Therefore, combustible loading is critical for preventing the spread of fire, minimizing fire severity and the ignition of gloves for the WCG. Not only does it remove or limit the continuity of the fuel source to sustain a fire, but it also reduces the likelihood of INVENTORY releases. Based on the importance of combustible loading, the accident analysis designates it as a specific administrative control. Commensurate with this designation, an LCO, which establishes the limits for combustible loading in the facility, is warranted.

LCO

The LCO for the Combustible Loading Control is composed of the following:

LCO 3.4 Conditional Statement #1 – $\leq$ 0.60 lb/ft^2 in BUILDING TA-50-69 on average. The accident analysis shows that, for a variety of natural ventilation conditions, and maintaining a combustible loading of ordinary combustibles $\leq$0.60 lb/ft^2, the upper layer temperatures within Room 102 remain below ~500°C for all scenarios, except the scenarios with the large vehicle doors open and a very large fire (~10 MW). There is another LCO which controls the BUILDING TA-50-69 CONFINEMENT INTEGRITY. Therefore, a limit of 0.60 lb/ft^2 on average is established for BUILDING TA-50-69, excluding the TRU waste that is in the WCG or staged in BUILDING TA-50-69, the materials and equipment necessary for operation within the WCG exclusion zone, and three Size 1 cylinders of P-10 gas (see discussion for P-10 gas below). The average combustible loading limit also excludes combustible components of the forklifts which are present on a transient basis to move TRU WASTE CONTAINERS within the building. This limit is verified QUARTERLY by the fire protection engineer.

LCO 3.4 Conditional Statement #2 – No flammable liquids or gases, and no combustible liquids with NFPA Flammability Rating greater than 1, are stored or used when INVENTORY is within BUILDING TA-50-69, except up to three Size 1 cylinders (~250 ft^3) of P-10 gas. Flammable and combustible liquids and gases present a unique fire risk because of their fire characteristics. Flammable and combustible liquids and gases add to the combustible loading of the facility are to be controlled as specified in LCO 3.4 Conditional Statement #2. The exception for this LCO is P-10 gas. Also excepted are flammable or combustible liquids which may be found in the TRU WASTE CONTAINER, and combustible liquids with a National Fire Protection Association (NFPA) Flammability Rating of 1 or 0.

P-10 gas is used in radiation monitoring equipment within BUILDING TA-50-

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69. It is made of 10% by volume of methane and 90% by volume of argon. According to experimental data (Bureau of Mines Bulletin 627), there is no downward flame propagation until 6% concentration and 100 °C ambient. Based on engineering judgment, any possible combustion starting with P-10 would be very *weak* and would quickly be diluted in air below its LFL. Also, a flame jet resulting from a sheared cylinder is even more difficult to obtain because of the turbulent mixing. A leak of P-10 gas within BUILDING TA-50-69 would be diluted below its flammability range, given the large volume of the room.

As for the classification of P-10 gas, the Compressed Gas Association (CGA) pamphlet CGA P-23-2003, *Standard for Categorizing Gas Mixtures Containing Flammable and Non-Flammable Components,* Section 4.2, states, "If the mixture is one of a single flammable component in a single non-flammable component and is shown in Table 1, the mixture is categorized as flammable if the concentration of the flammable component (expressed in percentage) exceeds that shown in Table 1." Table 1 lists methane with argon and identifies that mixtures are considered flammable when the methane component is greater than 7.7%. A footnote to the table and the methane entry states, "A mixture of less than or equal to 10% methane in argon is nonflammable according to DOT interpretation." According to Praxair's MSDS #E-4740-F for P-10, the gas is not flammable. In addition, it states, "this mixture cannot catch on fire." According to Chemwatch MSDS 23330, P-10 gas has a flammability rating of *extreme*. Given the conflicting statements in the literature, for conservatism, P-10 gas is considered flammable while inside a gas cylinder. It is excluded from the LCO because of the limited quantity and because the large volume of BUILDING TA-50-69 would dilute any potential leaks below the LFL, so P-10 is considered a very low risk. Therefore, flammable or combustible liquids and gases (except three size 1 cylinders of P-10 gas) are restricted from storage and use in BUILDING TA-50-69. However, this is limited to when INVENTORY is in the building since this will reduce the potential INVENTORY released during a fire.

Hazards associated with the presence of flammable or combustible liquids in TRU WASTE PACKAGES have been analyzed and controls have been identified to mitigate or prevent accident consequences associated with this material in the TRU waste matrix.Combustible liquids are classified by NFPA and by OSHA according to their flashpoint temperature. Liquids that have a flashpoint of 200 °F or higher are Class IIIB liquids (NFPA 30, and 29CFR1910.106) and have an NFPA 704 Flammability Rating of 0 or 1. These liquids require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. If a Class IIIB hydraulic fluid is released from a breach in a high-pressure containment vessel, it can result in an atomized spray or mist of droplets that can be ignited if the spray is close enough to an open flame or a metal surface heated to a temperature well above the fluid's flashpoint temperature, but the atomized spray is not spontaneously combustible. Such liquids will not start a fire and do not present the same fire hazard as flammable liquids (i.e., Class IA, IB, or IC liquids which have an NFPA Flammability Rating of 3or 4 and a flashpoint of 100 °F or lower) or combustible Class II or IIIA liquids with a Flammability Rating of 2 and a flashpoint between 100 °F and 200 °F. Due to the limited fire hazard associated

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with Class IIIB liquids, their presence in engineered, closed-loop containment systems within hydraulic lifting devices, compressor motors, or similar operations support equipment is excluded from the combustible liquid control. This exclusion applies to fixed equipment and to the forklifts used to move TRU WASTE CONTAINERS within BUILDING TA-50-69. The exclusion also applies to Class IIIB liquids such as soaps or cleansers that may be stored and used in the change rooms/restrooms.

LCO 3.4 Conditional Statement #3 – No combustibles shall be stored within the WCG Exclusion Zone, excluding drum liners or wrapping around DEGRADED/LOSS OF INTEGRITY drums that are inside BUILDING TA-50-69 being loaded and working amounts of materials necessary to complete bag-on/off operations such as tape, cheesecloth, and extra operator gloves. The WCG exclusion zone is 10 ft around the glovebox or up to the walls of Room 102 or the GBE, whichever is less. This exclusion zone is established to prevent the ignition of the WCG gloves and the possible ignition of the waste. Based on current combustibles within BUILDING TA-50-69, a bounding fuel package was determined to weigh ~50 lb. This could be in the form of a box of trash bags or trash bags that are used to contain booties, etc. Appendix 3D establishes "safe" distances for several combustible fuel packages to other types of combustibles. The gloves used for the glovebox fall in the normal ignition range (12 kW/m^2 – 15 kW/m^2) from unpiloted ignition due to radiant energy. Using the lower end of this range (12 kW/m^2), DSA Appendix 3D establishes a separation distance of 6 ft to prevent the ignition of the gloves through the mechanism of radiant energy. Therefore, an exclusion zone of 10 ft around the WCG glovebox shall be implemented to increase the margin of safety. The exception is the walls that are ~4.5 ft away from the WCG and the GBE that is less than 10 ft. from the WCG. These walls meet NFPA requirements to be classified as "limited combustibles." In addition, the surface finish of these walls meets interior finish for DOE facilities in having a flame spread rating of 25 or less and a smoke developed rating of 50 or less. The GBE is constructed of stainless steel and is non-combustible. The drum liners that are contained inside the drum and any wrapping around DEGRADED drums or drums exhibiting LOSS OF INTEGRITY must be excluded because they are part of the drum package. Working amounts of material such as tape, cheesecloth, and extra gloves worn by operators are needed as part of the bag-off/on operations. Combustible components of support equipment (e.g., wiring insulation, operator platforms and rubber mats) and the hydraulic fluid within the engineered, closed-loop containment systems of the daughter drum lifts beneath the WCG are not considered a stored combustible within the exclusion zone.

LCO 3.4 Conditional Statement #4 – No combustible fuel package inside Building TA-50-69 may be greater than 50 lb and must be separated from other combustibles $\geq$ 6 ft except in the change rooms/rest rooms. The 50-lb weight limit excludes computer equipment, three Size 1 P-10 gas cylinders, hydraulic fluid within the engineered, closed-loop containment systems of the forklifts and drum lifts required for operation, and the INVENTORY. The hydraulic fluid within the forklifts and drum lifts is also excluded from the 6-ft separation

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requirement. The computer equipment will be counted against the combustible loading of 0.60 lb/ft^2, but because of the difficulty in ignition of this fuel package it will be excluded for its weight limit only. The three Size 1 cylinders of P-10 gas will be excluded from the weight limit, but will be separated from other combustibles by ≥ 6 ft. This will prevent possible ignition sources (small fire) from being located near the cylinder. The DSA, Appendix 3D, establishes separation distances from ordinary combustibles to other combustibles to prevent their ignition through radiant energy. Establishing this control prevents a fire from spreading through radiant energy and limits the fire size.

LCO 3.4 Conditional Statement #5 – Combustible material inside and within 10 ft of the exterior of the transportainers shall be limited to those materials and equipment necessary to accomplish required tasks. The 10 ft separation distance helps prevent continuity of combustibles that could cause an outside fire to spread to transportainers which contain TRU WASTE CONTAINERS. The combustible restriction inside the transportainer helps to prevent the start or spread of a fire from inside to the surrounding area. The allowable combustibles include items such as combustible waste inside a closed TRU WASTE CONTAINER, container labeling, lid restraints, plastic wrapping around empty parent drums, gaskets that prevent rainwater intrusion into the transportainers, and plastic or rubber-wheeled container dollies that may be stored in or near the transportainers.

APPLICABILITY

This LCO is required in BUILDING TA-50-69 in OPERATION and WARM STANDBY MODES because INVENTORY is present during these MODES and could be impacted by the effects of a fire (i.e., offsite radiological release could occur). LCO Conditional Statement #5 (only) is also applicable to the area inside and within 10 ft of the exterior of the transportainers, *outside* BUILDING TA-50-69. The LCO is not applicable in COLD STANDBY because INVENTORY is not present (i.e., removed from the facility) during this MODE, and there is no risk of radiological dose consequences to the public.

CONDITION A, ACTIONS and COMPLETION TIMES

If Combustible Loading Control is not met, ACTION A.1 requires placing INVENTORY in a SAFE CONFIGURATION IMMEDIATELY upon the discovery that one or more of the OPERABILITY requirements for combustible loading is not met. The completion time of IMMEDIATELY ensures that ACTIONS to reduce the threat posed by potential fires are promptly implemented. This ACTION is to begin as soon as the condition is declared and actively and continuously pursued until complete. This completion time is the most conservative, yet realistic, period for accomplishing this ACTION.

ACTION A.2 requires establishment of a FIRE PATROL in BUILDING TA-50-69 within 2 hours, which is an ACTION that reduces the overall risk when combustible loading controls are not met. Once the FIRE PATROL is established, the FIRE PATROL shall sweep through BUILDING TA-50-69 at least once per hour. The safety analysis demonstrates that fire accidents result in the most severe offsite consequences to BUILDING TA-50-69. A FIRE PATROL compensates for an out-of-specification condition by providing inspection of BUILDING TA-50-69 for an incipient fire such that appropriate

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notification and fire-fighting response may be initiated, thus minimizing the potential for an offsite release. The FIRE PATROL can also prevent or correct potential fire risk/hazard situations (e.g., unauthorized hot work or combustible material shipments) and can take measures to extinguish small fires. Two hours is a reasonable time period to locate appropriate FIRE PATROL personnel and start inspections. Hourly sweeps by the FIRE PATROL are in accordance with institutional requirements and are a reasonable time period given the INVENTORY will be in a SAFE CONFIGURATION and BUILDING TA-50-69 is protected with a Fire Suppression System.

ACTION A.3 requires re-establishing combustible loading limits to those analyzed and brings BUILDING TA-50-69 (or the area surrounding the transportainers for LCO 3.4 Conditional Statement #5) back into the compliance within 24 hr. This ACTION reduces the likelihood of initiating an accidental release of INVENTORY.

SURVEILLANCE REQUIREMENTS

This SR VERIFIES through QUARTERLY inspection by a fire protection engineer (FPE) that combustible loading (excluding INVENTORY) meets the limits established in the LCO. For the room limit, the weight of combustibles

SR 4.4.1

(fixed + transient) in each room applicable to the assessment is counted and converted by the appropriate factor to an equivalent weight of ordinary combustibles. The sum of the weights for each location is averaged over the square footage from BUILDING TA-50-69 to produce an average combustible loading in lb/ft^2 as a conservative measure. Excluded from the determination of average combustible loading average are the INVENTORY, the combustible components of the forklifts, hydraulic fluid within the engineered, closed-loop containment systems, and materials within the WCG exclusion zone that are needed to support operations. The calculated level is then compared with allowable levels.

The procedure that implements this SR will be approved by an FPE. This procedure will contain details to perform this SR. Attachments to the procedure will be provided in the form of a checklist that provides the types of combustibles within BUILDING TA-50-69 along with conversion factors to convert to “ordinary combustibles” and any de-rating that may be applicable. De-rating is performed using NFPA guidance and is used to account for combustibles that may be stored within metal containers. A miscellaneous column will also be provided in the attachment for items not listed. Once the pounds of combustibles have been tallied for BUILDING TA-50-69, the floor area will be used to obtain the combustible loading in units of lbs/ft^2. This value will then be compared to the 0.60 lb/ft^2 in order to VERIFY the combustible loading is within the LCO limit. Therefore, a QUARTERLY INSPECTION by an FPE is adequate.

SR 4.4.2

This SR VERIFIES through DAILY inspection by facility personnel that no flammable liquids or gases, and no combustible liquids with NFPA Flammability Rating greater than 1, are stored or used in BUILDING TA-50-69 when INVENTORY is present as established in the LCO. Class IIIB liquids with an NFPA Flammability Rating of 1 or 0, such as hydraulic fluids within drum lifting devices, oil within a compressor, and soaps or cleansers in the change

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A3/4.4 BUILDING TA-50-69 COMBUSTIBLE LOADING

rooms/restrooms are excluded from this surveillance. This surveillance also excludes three size 1 cylinders of P-10 gas and flammable or combustible liquids found in the TRU WASTE CONTAINER. These prohibited items are not used as part of normal OPERATIONS. The combination of QUARTERLY INSPECTIONS by an FPE for SR 4.4.1 and DAILY INSPECTIONS by facility personnel for SR 4.4.2 provide a robust process for combustible loading control.

SR 4.4.3 This SR VERIFIES through DAILY inspection by facility personnel that no combustibles are stored within the WCG exclusion zone, excluding drum liners or wrapping around DEGRADED/LOSS OF INTEGRITY drums that are inside BUILDING TA-50-69 being loaded, and working amounts of materials necessary to complete bag-on/off operations such as tape, cheesecloth, and extra operator gloves. Combustible components of support equipment (e.g., wiring insulation, operator platforms and rubber mats) and the hydraulic fluid within the engineered, closed-loop containment systems of the daughter drum lifts beneath the WCG, are not considered stored combustibles within the exclusion zone. The combination of QUARTERLY INSPECTIONS by an FPE for SR 4.4.1 and DAILY INSPECTIONS by facility personnel for SR 4.4.3 provide a robust process for combustible loading control.

SR 4.4.4 This SR VERIFIES through DAILY inspection by facility personnel that no combustible fuel packages are greater than 50 lb and the combustible fuel packages are separated from other combustibles by 6 ft, excluding the change rooms/rest rooms. INVENTORY, combustible components of the forklifts, hydraulic fluid within the engineered, closed-loop containment systems, and materials within the WCG exclusion zone that are needed to support operations are excluded from the 50-lb weight limit and the 6-ft separation limits.

The procedure that implements this SR will be approved by an FPE. This procedure will contain specific examples of combustibles to verify and details to perform this inspection. For any items not included in the procedure, the specific examples established by the FPE QUARTERLY INSPECTION can be used as a baseline. Within the procedure an attachment can be used that breaks down BUILDING TA-50-69 into areas, along with a floor plan of the BUILDING TA-50-69, so that once the area has been surveyed it can be documented with a signature or a check mark. The combination of QUARTERLY INSPECTIONS by an FPE for SR 4.4.1 and DAILY INSPECTIONS by facility personnel for SR 4.4.4 provide a robust process for combustible loading control.

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A3/4.4 BUILDING TA-50-69 COMBUSTIBLE LOADING

SR 4.4.5

This SR VERIFIES through WEEKLY inspection by facility personnel that only combustible materials and equipment that are operationally necessary are present inside and within 10 ft of the exterior of the transportainers. Because the rigid metal transportainers protect TRU waste containers stored inside (during OPERATION or WARM STANDBY MODE) from involvement in a grass wildland or similar combustible fire, a WEEKLY surveillance provides adequate assurance that continuity of combustibles will be limited.

The procedure that implements this SR will be approved by an FPE. This procedure will contain specific examples of combustibles to verify and details to perform this inspection.

REFERENCES

Appendix 3D, *Fire Accident Calculations,* WCRRF DSA.

NFPA 30, *Flammable and Combustible Liquids Code*

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*

10 CFR 1910.106, Occupational Safety and Health Standards, Flammable and combustible liquids.

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A3/4.5 WASTE CHARACTERIZATION GLOVEBOX DRUM LIFT FIXTURE

BACKGROUND SUMMARY

The WCG Drum Lift Fixture is used to lift a vertical drum sitting on the floor and position the drum horizontally against the side of the WCG.

The drum is positioned against the trolley and attached to the trolley with two steel drum restraining straps. The trolley is then pulled along the trolley support rail by a cable attached to an electric hoist. The trolley rails are supported by a tubular steel frame anchored to the concrete floor and the drum lift fixture is qualified to meet PC-2 seismic events. The electric hoist and cable are enclosed by the tubular steel frame. The hoist is operated manually by an operator. The drum lift fixture is rated for drums that weigh up to 630 lb.

APPLICATION TO SAFETY ANALYSIS

The WCG lift system provides a preventative and mitigative function for drum spill scenarios inside BUILDING TA-50-69 during placement of a drum for repackaging in the WCG and during seismic events. By controlling the lift speed and trajectory, the drum is positioned from vertical to horizontal and lifted into position while being fully supported.

LCO

BUILDING TA-50-69 shall have an OPERABLE WCG glovebox drum lift fixture demonstrated by the following:

LCO 3.5.1 Condition #1: The drum lift fixture shall be capable of supporting a drum weighing at least 630 lbs during normal operations and PC-2 seismic events.

LCO 3.5.1 Condition #2: The drum lift fixture hoist holding brake shall be capable of stopping and holding a drum weighing at least 630 lbs when the lifting controls are released.

LCO 3.5.1 Condition #3: The drum lift fixture hoist shall be capable of limiting the lowering speed of a drum loaded to at least 630 lbs to 26 ft/min following loss of power.

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A3/4.5 WASTE CHARACTERIZATION GLOVEBOX DRUM LIFT FIXTURE (cont.)

APPLICABILITY

This LCO is applicable to BUILDING TA-50-69 in OPERATION and WARM STANDBY MODES since INVENTORY could be on the WCG Drum Lift Fixture BUILDING TA-50-69 in these MODEs.

CONDITION A, ACTIONS and COMPLETION TIMES

CONDITION A is entered when the WCG Drum Lift Fixture is INOPERABLE, meaning that it is not capable of safely supporting a drum weighing 630 lb as indicated by signs of physical degradation, or the drum lift hoist brake is INOPERABLE in its capability to hold a drum or slow its lowering during a loss of power. Under these conditions, the following ACTION(s) constitute approved measures to account for the increase in risk associated with an INOPERABLE drum lift fixture with INVENTORY on the WCG lift.ACTION A.1 requires placing INVENTORY in a SAFE CONFIGURATION. This may involve placing a lid on the drum, disconnecting the drum from the WCG, lowering the drum to the floor, and removing the drum from the drum lift fixture. Removal of the drum restores the facility to an analyzed condition. If it is not safe to lower the drum to the floor, the drum lid may be placed on the drum and the drum left on the drum lift fixture if it is securely in place. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed.

ACTION A.2 requires restoring the drum lift fixture to OPERABLE prior to using the drum lift fixture. Completion of this step allows exit from the entry condition.

SURVEILLANCE REQUIREMENTS

SR 4.5.1

The drum weight is verified to be less than 630 lb prior to lifting to VERIFY the drum is within the analyzed capacity of the drum lift fixture. Lifting drums that are within the WCG drum lift fixture name plate capacity will ensure that the probability of lift failure remains within that analyzed in the DSA.

SR 4.5.2

This surveillance VERIFIES there is no visual indication of degradation of holding bands, holding band hinges including associated welds, and rollers. Physical indications of degradation indicate that the drum lift fixture trolley may no longer be capable of supporting 630 lb during normal operations or a PC-2 seismic event. A DAILY frequency ensures the trolley and associated holding mechanisms do not degrade during the course of normal operations.

SR 4.5.3

This surveillance VERIFIES that there is no visual indication of cracked welds, missing fasteners, loose parts, excessive wear, or unusual deformation of the drum lift fixture that might affect lifting or seismic capability. Physical indications of degradation indicate that the drum lift fixture may no longer be capable of supporting 630 lb during normal operations or a PC-2 seismic event. SB-DO: CALC 07- 012 (see References) specifies a physical inspection as a minimum prior to the annual lift load testing.

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A3/4.5 WASTE CHARACTERIZATION GLOVEBOX DRUM LIFT FIXTURE (cont.)

SR 4.5.4 This surveillance VERIFIES that the WCG drum lift fixture can support the rated lift capacity. The structural strength of the hoist, cable, tubular support frame, trolley support rails, trolley, and drum restraint straps will be verified by an annual loading test. Per DOE-STD-1090-96 (see References), the load test shall be at 125% of the name plate capacity, 788 lb.

SR 4.5.5 The hoist has a spring-applied, electrically released holding brake. The operation of the holding brake shall be VERIFIED during an annual load test at 125% of the rated load, 788 lb. During this inspection, the holding break shall be VERIFIED as being capable of stopping and holding the drum weighing at least 788 lb when the controls are released. SB-DO: CALC 07- 012 recommends an annual holding brake test.

SR 4.5.6 The hoist has a spring-applied, electrically released holding brake. The operation of the holding brake shall be verified during an annual load test at 125% of the rated load, 788 lb. During this inspection, the holding brake shall be VERIFIED as being capable of limiting the lowering speed of a drum weighing at least 788 lb to 26 ft/min upon loss of power. This speed is the maximum lowering speed of the hoist (22 ft/min) plus 4 ft/min, which accounts for the specific loss of power response of the hoist used on the drum lift fixture, according to the manufacturer. SB-DO: CALC 07- 012 analyzed drops of drums at this speed and demonstrated they are acceptable. SB-DO: CALC 07-012 also recommends an annual frequency for this test.

REFERENCES

TA50-69 (WCRRF) Drum Lift Fixture, SB-DO: CALC 07-012, Los Alamos National Laboratory, Los Alamos, NM, March 15, 2007, Rev. 1.

DOE-STD-1090, *Hoisting and Rigging*, U.S. Department of Energy, 1996

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A3/4.6 BREACHING UNVENTED, SEALED 30- to 5-GAL. METAL WASTE PACKAGES IN WCG

BACKGROUND SUMMARY

Items that are not in conformance with the WIPP WAC are remediated in the WCG.

The remediation process includes the opening of unvented, sealed WASTE PACKAGES which could potentially have a build-up of a flammable gas mixture, and if improperly opened in the WCG, a deflagration can occur. If a deflagration is to occur, WCG operators with their hands and arms in the glovebox may be injured, and the WCG may be breached due to an ejected WASTE PACKAGE lid.

DOE Standard 5506, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities* (DOE 2007) cites results of Idaho Drum Deflagration Tests. Several drums were filled with representative combustible/metal waste matrices; the drums were also pressurized with a flammable gas mixture comprised of oxygen, hydrogen, and nitrogen. The test drums were then subjected to sparks, a drill bit puncture, or a 12-foot drop. The results showed that puncturing or dropping the test drum did not result in a deflagration. In the 12-foot drop test, when the drum impacted the ground, it rotated a complete 180 degrees, yet it did not deflagrate nor did it show signs that a fire occurred within the drum. This indicates that movement of metal items within the test drums did not produce enough of a spark to ignite the flammable gas mixture. Extending this result to WCG operations, it is not expected that handling an unvented, sealed drum, such as removing the lid from the drum, will most likely not cause the drum to deflagrate if a flammable gas mixture is present within the drum. The drums that deflagrated in the Idaho tests, were the ones that were impacted with a soft (20 milli-Joules) or hard (5 Joules) spark. Extending this particular result to WCG operations indicates that by preventing the occurrence of sparks, a deflagration will not occur if a flammable gas mixture exists with the WASTE PACKAGE when it is breached.

When processing unvented, sealed metal WASTE PACKAGES within the WCG, the use of non-sparking tools (SAC 5.10.1.6) and grounding the metal WASTE PACKAGE and parent 55-gallon drum will prevent the introduction of sparks when breaching the unvented, sealed metal WASTE PACKAGE. Again, as indicated by the drum deflagration tests, spark production within the waste matrix by metal waste items rubbing against each other by the movement of an unvented, sealed container is not sufficient to cause a deflagration of a flammable gas mixture within the container. However, unvented, sealed metal WASTE PACKAGES should be handled with care.

This control is applicable to unvented, sealed metal WASTE PACKAGES that have a volume of 30- to 5-gallons. Unvented, sealed metal WASTE PACKAGES are WASTE PACKAGES that have a positive locking mechanism, such as a gasket with locking ring, or a screw top lid (with no other openings) to seal the lid to the WASTE PACKAGE.

An engineering calculation was performed to analyze hydrogen concentrations in

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A3/4.6 BREACHING UNVENTED, SEALED 30- to 5-GAL. METAL WASTE PACKAGES IN WCG

the WCG if a 30-gallon drum with 100% hydrogen, pressurized to 11 psig, was released into the WCG (LANL Calculation CALC-07-50-069-000-0005-M-R-0). Using some of the same calculations, the WCRRF Safety Basis Addendum No. 2, shows that breaching unvented, sealed packages volumes smaller than 5-gallons will not cause the overall WCG atmosphere to attain hydrogen concentrations near 4% which is the lower flammability limit for hydrogen. The application of a ground on these smaller containers is not practical; however, the control for the use of non-sparking tools and de-energizing WCG receptacles, via SAC 5.10.1.6 is considered sufficient to prevent any flammable gas mixture to deflagrate in WASTE PACKAGES smaller than 5-gallons.

APPLICATION TO SAFETY ANALYSIS

Ensuring the parent 55-gallon drum and the unvented, sealed metal WASTE PACKAGES are grounded when the metal WASTE PACKAGE is breached and for 30 minutes after the removal of the lid and lid restraining device, ensures sparks are minimized which could ignite a flammable gas mixture within the metal WASTE PACKAGE. This is a credited control in the WCRRF Safety Basis Addendum No. 2 hazards analysis to prevent the introduction of sparks while breaching an unvented, sealed metal WASTE PACKAGE that could contain a flammable gas mixture.

LCO

When breaching a positively sealed 30- to 5-gallon metal WASTE PACKAGE in the WCG, the following shall be fulfilled:

LCO 3.6.1: The parent 55-gallon drum bagged-on to the WCG and metal WASTE PACKAGE shall be grounded when the metal WASTE PACKAGE is breached and for 30-minutes after the removal of the lid and lid restraining device.

The application of the ground must be able to bond to the drum and metal WASTE PACKAGE surface through possible layers of paint or wrapping. Methods to ensure a bonded ground could include the use of a wire brush to scratch through any insulating surfaces to reach the metal, or a ground clamp that can penetrate through an insulating surface to reach the surface of the metal WASTE PACKAGE.

Once the metal WASTE PACKAGE is breached, the lid and lid restraining device is carefully removed from the metal WASTE PACKAGE, and carefully set-aside. The use of non-sparking tools, via SAC 5.10.1.6 and grounding the metal WASTE PACKAGE, via this LCO, ensures no sparks are produced as the lid restraining device is removed.

Removing the lid and lid restraining device allows any flammable gas mixture within the confines of the WASTE PACKAGE to diffuse through a fully opened WASTE PACKAGE for 30 minutes, prior to removing the ground.

APPENDIX A – BASES

A3/4.6 BREACHING UNVENTED, SEALED 30- to 5-GAL. METAL WASTE PACKAGES IN WCG

APPLICABILITY

This LCO is applicable to BUILDING TA-50-69 in the OPERATION MODE since this is the MODE in which WCG remediation activities occur and which may involve unvented, sealed WASTE PACKAGES.

CONDITION A, ACTIONS and COMPLETION TIMES

CONDITION A is entered when the parent 55-gallon drum bagged-on to the WCG and/or metal WASTE PACKAGE is not grounded when the metal WASTE PACKAGE is breached and for 30 minutes after the removal of the lid and lid restraining device. Under these conditions, the following ACTION(s) constitute approved measures to account for the increase in risk associated with the CONDITION.

ACTION A.1 requires that all WCG operations are ceased for 30 minutes. The ACTION begins when the condition is declared and is continuously pursued until the ACTION is completed.

Thirty minutes is considered a sufficient amount of time for any flammable gas within the confines of the metal WASTE PACKAGE to diffuse out of the metal WASTE PACKAGE and WCG when the lid is removed from the WASTE PACKAGE. By IMMEDIATELY ceasing operations for 30 minutes, no spark producing activity can occur which could deflagrate a flammable gas mixture.

ACTIONS A.2.1 through A.2.3 are performed only if the lid restraining device is installed on the breached metal WASTE PACKAGE.

ACTION A.2.1 requires the grounding strap to be applied IMMEDIATELY after the COMPLETION of ACTION A.1. This ACTION, along with SAC 5.10.1.6 – use of non-sparking tools, ensures that no sparks are produced when the lid restraining device is removed.

ACTION A.2.2 requires the removal of the lid restraining device and lid, which is performed IMMEDIATELY after the COMPLETION of ACTION A.2.1.

ACTION A.2.3 requires ceasing all WCG operations for an additional 30 minutes IMMEDIATELY following the COMPLETION OF ACTION A.2.3, which ensures that any flammable gas within the confines of the WASTE PACKAGE can diffuse through a fully opened metal WASTE PACKAGE, prior to removing the ground.

SURVEILLANCE REQUIREMENTS

SR 4.6.1

Prior to breaching the metal WASTE PACKAGE, a surveillance will be performed to verify that the parent 55-gallon drum bagged-on to the WCG and the unvented, sealed metal WASTE PACKAGE are grounded. This ensures that sparks are minimized when breaching an unvented, sealed metal WASTE PACKAGE that could have a flammable gas mixture.

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A3/4.6 BREACHING UNVENTED, SEALED 30- to 5-GAL. METAL WASTE PACKAGES IN WCG

REFERENCES

LANL Calculation CALC-07-50-069-000-0005-M-R-0, *Bounding Hydrogen Concentration from 30 Gallon Sealed Container to the WCRRF WCG Glovebox,* November 2007.

Processing Unvented, Sealed Waste Packages in the WCG, WCRRF Safety Basis Addendum No. 2 (current Rev.), November 2007.